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ABSTRACTS OF TUBERCULOSIS

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Treatment of Osteo-Articular Tuberculosis.—Radical surgical treatment of this form of tuberculosis has been disappointing and conservative measures are favored. The latter include heliotherapy which is undoubtedly a powerful adjuvant. Patients are best treated at the seaside or in the country, on a southern slope with low rainfall, porous soil, clear atmosphere and equable temperature; wind is no disadvantage. A locality where tuberculosis is not common is also advisable. Local treatment comprises cure of the local lesion, prevention or correction of deformity and treatment of complications. Immobilization in a moulded plaster splint is effected, using bandages of plain book muslin, no. 11. Sores under the plaster can be recognized best and earliest by a fetid smell. Plasters should be regularly smelt and any sore detected have a window cut down to it. Edema of the limb below the plaster should be treated by bandaging from the periphery upwards. Immobilization is further secured by fixing the joints above and below the lesion. Extension is used to correct deformities. Incision of cold abscesses leads to sinus formation and is condemned. After aspiration, on the other hand, the abscess wall collapses and, if the cavity be kept empty, it is thickened, shrinking toward the causative lesion and becoming finally a fibrous envelope which slowly absorbs. The chief points to remember in aspiration are: 1. Asepsis as for a major operation. 2. Puncture beginning some distance from the abscess, so that the needle traverses healthy tissue and, when withdrawn, leaves a valve-closing track and also punctures away from a dependent part. 3. Aspirate slowly. 4. Avoid ethyl chloride spray or the puncture wound is liable to become septic. 5. After aspiration apply a pad and bandage firmly. Pus too thick to run through the cannula may be treated with a modifying fluid or by a small amount of sterile water.—*The Treatment of Osteo-Articular Tuberculosis, C. L. Pattison, Tubercle, November, 1922, iv, 65.*

Treatment of Tuberculous Spondylitis.—In order of incidence tuberculosis involves the spine, the hip and the knee; other lesions are scattered throughout the body. To prevent the disease Massachusetts is now accepting Federal aid in cleaning up herds of tuberculous cattle; of the milk-producing herds 25 to 40 per cent give positive tuberculin reactions. In New York City, attention to this source of infection has been effective in materially reducing the incidence of bone tuberculosis. Any sound preventive measures should be furthered by the physician. The treatment of spinal tuberculosis differs in children and adults. In children the bones are soft and growing, the disease tends to destroy the vertebrae and intervertebral discs, and healing by calcification is slow, requiring months or years. Although all painful symptoms may rapidly disappear with recumbency, the pathological process is still present and, if the child is allowed up, even with supporting jackets or braces, the superimposed weight tends to cause pressure on the slowly healing process, and the result is either a recurrence of the symptoms or an increase in the deformity. In children a period of recumbency either on a frame or in a plaster shell should be carried out for two to three years, preferably three. During this time there should be no superimposed weight on the spine, such as from sitting or standing. At the end of this time, if the X-ray picture shows new bone formation and there are no signs of acute disease, the child may be allowed very short periods of being up, provided the spine is given

sufficient support. At least two years more of gradually increasing weight-bearing is necessary before it is safe to allow complete freedom, and some think supports should be worn until adult life. In adults, the bone is not growing and the time element in treatment is important, but the lesion is a grave one and other foci often appear as long as five years after operation. A patient with an acute or subacute pulmonary lesion is a poor operative risk. In selected cases a stabilizing operation on the spine, either the fusion operation of Hibbs, or the bone graft of Albee, or the bone periosteal flap method of Delangenière, may be successful. Without operation, recumbency is necessary for at least a year, and this is followed by a jacket or brace for two to three years more. With operation the time of recumbency may be shortened to six months, but the jacket or brace support should be worn for a year or two. *Conclusions:* 1. There are no accurate statistics in Massachusetts as to the number of nonpulmonary cases of tuberculosis; this is because cases are not reported by physicians and hospitals. 2. Surgery in tuberculosis is and should be the exception, and should be only an incident in the general and necessarily prolonged treatment. 3. In children, operations for spinal immobilization are not advisable and, without the proper postoperative care, in adults they do not give the results claimed. 4. In tuberculosis of the spine of both children and adults the ambulatory and supporting treatment has not given satisfactory results. 5 and 6. In children the ideal treatment is that described above and in adults immobilization may be advisable. 7. There are no hospitals in Massachusetts with an equipment or a personnel which can adequately carry out the proper prolonged treatment of recumbency and heliotherapy. 8. It is the duty of the medical profession of Massachusetts to urge the legislature to provide as adequate opportunity for the treatment of nonpulmonary tuberculosis as is provided for the pulmonary cases.—*Tuberculosis in Children from the Standpoint of the Surgeon, L. T. Brown, Boston M. & S. J., September 28, 1922, clxxxvii, 470.*

Surgical Treatment of Tuberculous Spondylitis.—Albee's original method of removing a piece from the tibia and implanting this in the split dorsal processes proved successful in 150 cases. In one case where Henle's technique was used, that is, implantation of two splints, one on each side of the dorsal processes, a laminectomy and removal of bone had to be resorted to on account of aggravation of the patient's condition. At operation a bony union between the parts was lacking.—*Zur Frage der Spanbildung und Empflanzung des Spans nach Albee bei Spondylitis Tuberculosa, H. Görres, Zentralbl. f. Chir., 1922, xlix, 784.*

New Plaster Shell for Treatment of Pott's Disease.—The defects of the old plaster shell used for the treatment of tuberculous spondylitis in children are pointed out, and a new shell with an adjustable fulcrum is described. This apparatus obviates former defects and is much more comfortable for patients, easier to handle and much less expensive; it is also practical for treatment in the home and out-patient department. Photographic reproductions of the shell and roentgenographs showing its mechanical effects are included.—*The Mechanics of a New Plaster Shell in the Treatment of Pott's Disease in Children, with Lateral X-ray Control, R. P. Schwartz, J. Bone & Joint Surg., October, 1922, iv, old series, xx, 789.*

Bony Bridging in Tuberculosis of Spine.—Bony bridging of the vertebrae in spondylitis has ordinarily been considered evidence of the nontuberculous nature of the disease and has been generally accepted as pathognomonic of certain other types. The fallacy of this deduction was forcibly shown in the case of a patient admitted to the Cincinnati General Hospital in November, 1917, who showed this bony bridging clearly between the second and third lumbar vertebrae and later developed a psoas abscess, the pus of which caused tuberculosis on guinea pig inoculation. This led to more careful observation of other patients suffering from spondylitis, and in at least one out of every ten cases of tuberculosis of the spine the X-ray disclosed either a projecting deposit of lime salts or a complete bony bridge. It appears that such bridging occurs most often from a calcareous deposit in either an anterior or lateral intervertebral ligament, but occasionally also by a process of periosteal production of new bone. It is not necessarily confined to the region in which carious destruction has taken place. The immunity and resistance of the host may play an important rôle in this process, as hypertrophic bone changes are characteristic of low grade, chronic infections. Mechanical or static influences may also play a part. The commonest site of bony bridging is in the dorsolumbar and lumbar region.—*Bony Bridging in Tuberculosis of the Spine, R. B. Cofield, J. Am. M. Ass., October 21, 1922, lxxix, 1391.*

Dangers of Henle-Albee Operation.—The author discusses the fractures of the bone splint that occur in extraärticular arthrodesis (artificial ankylosis) and states that an *Umbauzone* occurs, which then fractures on account of muscular action. Such an occurrence is also observed in the Albee operation and the subsequent aggravation of the hump-back is traceable to this cause.—*Zur extraarticulären Arthrodese bei Gelenktuberkulose einschliesslich der Henle-Albeeschen Operation, A. Nussbaum, Zentralbl. f. Chir., 1922, xlix, 780.*

Poncet's Tuberculous Rheumatism.—A twelve year old girl, with a positive Pirquet, negative Wassermann and a family history of tuberculosis, suffered from articular rheumatism of the hand, elbow and ankle joints with contractures. It was of two years' duration. Biopsy of the *bursa olecrani* showed the wall of the bursa to consist of an inflammatory fibrous tissue with caseation at the periphery, numerous epithelioid cells and few atypical giant cells. There were no definite tubercles. X-ray of the chest showed greatly enlarged hilum nodes. The extremely chronic course and slight fever, without involvement of the heart or abscess formation, seem to support Poncet's view that this condition was due to a weak strain of tubercle bacilli or their toxins. In the author's opinion the primary focus was in the lungs, from which the tubercle bacilli spread to the joints by the blood. Heliotherapy and tuberculin were applied vigorously for two years without result.—*Über einen histologisch untersuchten Fall von tuberkulösen Gelenkrheumatismus (Poncet), B. Valentin, Ztschr. f. Tuberk, July, 1922, xxxvi, 336.*

Reactivation of Renal Tuberculosis.—A caseous kidney had old healed tuberculous lesions and new miliary and follicular lesions, which presumably dated from an acute cystitis that began six months previous to operation. The superimposed ascending infection which remained untreated for six months had, presumably, reactivated the latent tuberculosis of the kidney.—*Tuberculose renale à evolution retardée et reactivée, Escat, Meeting Soc. de Chirurgie de Marseilles, April, 1922, Reported in Presse Méd., May 6, 1922, xxx, page 395.*

Treatment of Renal Tuberculosis.—Early renal tuberculosis in the clinical sense is not identical with that in the pathological sense, and cannot with the present status of urological technique be definitely determined; it is more probable that a renal tuberculosis thus determined is well progressed. If the tuberculous process is to be determined by its disintegration products, then one dare not refer to a beginning disease, but only to one with mild associated symptoms and one with more marked secondary changes. There is, however, no justification to treat these two groups along different lines. Even if tuberculosis in its various stages can spontaneously heal, the conservative treatment of renal tuberculosis is too uncertain to be dependable. Kidney removal on the other hand is a logical treatment, with clear cut indications on which we must depend.—*Zur Behandlung der Nierentuberkulose, J. J. Stutzin, Zentralbl. f. Chir., 1922, xlix, 42.*

Conservative Treatment of Renal Tuberculosis.—The study includes 61 cases of renal and bladder tuberculosis, of which 26 were bilateral and 35 unilateral with observation periods of at least nine months. Of the former 22 and of the latter 12 were operated upon. In 23 unilateral cases treated with tuberculin alone there was a regression of the tuberculous process as seen at the ureter mouth, the urine became clearer and former elements of an inflammatory nature diminished; and after two months a slight improvement of the kidney function (indigo-carmine and phloridzin tests) was noted. After six to nine months the kidney function was normal and tubercle bacilli were absent from the urine even by animal inoculation. No recurrence occurred in any of these cases. Other tuberculins proved less suitable than O.T. Conservative O.T. treatment is indicated in uncomplicated renal tuberculosis without involvement of the ureters and bladder. If treatment does not result in improvement within two to three months, operation is to be advised.—*Zur konservativen Behandlung der Nierentuberkulose, E. Wassidlo, Centralbl. f. Chir., August, 1921, xlviii, 1182.*

Loss of Water by Lungs During Infantile Diarrheas.—Marfan and Dorlencourt have compared the respiratory output of water in normal babies with the output during ordinary diarrhea and during cholera infantum. They found in ordinary diarrhea that water given off from the lungs was diminished one-half, but that it increased more than a third in choleriform diarrhea. There is, then, a mechanism preventing dehydration which is unable to counterbalance the excessive loss of water due to severe cases of diarrhea.—*Résumé made to Société Francais de Physiothérapie, June 2, 1922, Reported in Prog. Méd., July 1, 1922, 311.*

Occlusion of Ureter by Tuberculous Mesenteric Lymph Nodes.—Tuberculous mesenteric lymph nodes, as a result of periadenitis with adhesions or direct obstruction of the ureter, can lead to kidney disturbances. A case of occlusion is reported with hydronephrosis associated with colicky pains. The removal of the nodes resulted in a permanent cure.—*Der Ureterverschluss durch Mesenterialdrüsen-Tuberkulose, E. Valentin, Arch. f. klin. Chir., 1921, cxviii, 189.*

Tuberculosis of Testis in Child.—Whether or not tuberculosis may be primary in the body of the testis has aroused much argument. Hektoen states that "tuberculosis of the testis and epididymis is common, and it may be primary in either organ in the sense that the testis or the epididymis may be the first organ in the genitourinary tract to be affected." A case is reported of tuberculosis of the testis in a three-year-old child. The left testis, epididymis and as much of the vas deferens as could be reached, were removed at operation. The wound healed by primary union. The child suffered no extension of the process. The pathological diagnosis was diffuse productive tuberculosis of the testis. There was a slight inflammatory reaction of nontuberculous character found in the epididymis. The literature on the subject is reviewed and discussed. *Conclusions:* 1. Tuberculosis of the testis may be primary and even solitary as far as the genitourinary tract is involved. 2. The infection when primary in the testis is hematogenic and first involves the blood vessel walls, later breaking into the lumen of the tubules. 3. Infection via the mucous surface is possible in the chronic type of disease but is not the only method of dissemination. 4. Acute hematogenous tuberculosis of the testis involves the entire gland, owing probably to the rich anastomoses of the peculiar blood supply of the organ. 5. Tuberculosis of the male genital tract is more often multicentric than single. 6. Tuberculosis may affect the testis on one side and the epididymis or seminal vesicle on the opposite side. 7. The testis is usually, in the adult, secondarily involved by extension from the epididymis. In children the reverse is true. 8. Surgical removal of a tuberculous testis is indicated in acute infections of the gland if there is no evidence of other tuberculous foci. The disease may be localized there. 9. Unilateral radical removal of the seminal tract is not indicated, because involvement of contralateral organs is not infrequent in the disease, while corresponding organs may be free. 10. General hygienic care and upbuilding of the patient, as advised by Thompson Walker in the treatment of chronic cases, is rational. 11. The roentgen ray offers the hope for cure in many cases of the chronic type, as recent reports indicate.—*Tuberculosis of the Testis in a Child, J. S. Eisensstaedt, J. Am. M. Ass., December 16, 1922, lxxix, 2076.*

Genital Tuberculosis in Women.—The study includes 55 cases, 43 of them involving the peritoneum, 19 the Fallopian tubes, 7 the corpus uteri, 4 the cervix, 7 the ovaries, 1 the vulva, and none the vagina. Besides these, 3 of the 55 involved the intestines. Peritoneal tuberculosis was of great significance for the genital tuberculosis. The height of the tuberculous disease lay between the twentieth and fortieth years, the height of the reproductive period. In the seventieth year another increase occurred in the incidence of the tuberculosis cases, corroborating the views of Lubarsch. In no case could a primary infection of the genitalia be definitely, or even possibly, determined. Secondary infection of the tubes as a result of a dipping of the fimbriae into the peritoneal fluids or as a result of the influx of the fluid into the tube inlets is more frequent than hematogenous infection of the female genitalia. The view expressing the importance of hematogenous infection is based less on anatomic findings than upon the findings of tubercle bacilli in the blood, which, to say the least, have been reduced to a minimum as a result of animal experiments, in which it was shown that the latter occurs only in the last stages of tuberculosis. Peritoneal tuberculosis, from which the infection of the genitalia usually originates, occurs most frequently in childhood. The hypoplasia of the genitalia is in many cases the result of tuberculous infection; in others it appears to favor its development.—*Anatomisch-pathologische Beiträge zur weiblichen Genitaltuberkulose, G. Bertolini, Zentralbl. f. Gynaek., December, 1921, xlv, 1830.*

Diagnosis of Female Genital Tuberculosis.—A case of ulcerated cervix is reported, clinically resembling carcinoma, and which test excision designated as cancer. The case was treated with mesothorium, but three weeks later a total extirpation was performed. Microscopic examination then left no doubt that the condition was tuberculosis and not cancer. An error in diagnosis in which tuberculosis is called carcinoma can easily occur, especially in transverse sections. It is important therefore that the sections are examined many times microscopically before making a final diagnosis.—*Ein*

Beitrag zur Diagnose der weiblichen Genitaltuberkulose, Zentralbl. f. Gynäkol., June, 1921, xlv, 854.

Endothelial Response in Tuberculous Meningitis.—Previous articles in this series called attention to the importance of the vascular endothelium as a source of the mononuclear phagocytes or macrophages in conditions resulting from inflammation or injury. The present article deals with this phenomenon as manifested in experimental tuberculous meningoencephalitis. The latter is a process practically limited to the meninges and their vascular extensions into the substance of the brain. It differs from tuberculosis elsewhere, however, in the fact that it shows a well marked tendency to limit itself to the mesodermal elements of the brain; there is a far greater lymphocytic reaction and many large mononuclears circulating in the vessels of the affected area are found. Sometimes fewer giant cells are present. That the tubercles are formed in or near vessels and that their epithelioid cells are probably of endothelial origin has been fairly well established. Experiments were done to determine the origin of the mononuclear macrophages that circulate in the meningeal vessels and through the lymph spaces of the piaärachnoid in tuberculous meningitis. Rabbits were inoculated with 0.2 mgm. of bovine tubercle bacilli through an opening trephined in the right parietal bone. All were given Niagara blue, intraperitoneally, and Higgins' waterproof drawing ink intravenously. These dyes were administered thereafter twice a week until the rabbits became too sick for further injections. In from two to three weeks the rabbits were killed and sectioned. In general, microscopic examination showed all the tubercles to be more or less deeply pigmented with ink granules; there was little or no Niagara blue, except in the form of coarse granules in the discrete macrophages of the meningeal lymphatics, cells which also contain ink. The free mononuclears were found in large numbers in the veins and capillaries of the meninges, and less frequently in the arteries. Fully a third to a half of their number contain ink granules which indicates their endothelial origin. These cells are frequently found in mitosis. The reasons for considering any ink-bearing cell as endothelial has been discussed in preceding papers. These endothelial cells are derived apparently from other sources than the neighboring capillary endothelium alone. Experiments on splenectomized rabbits did not show any material decrease in the available supply of circulating macrophages. While these cells may originate in the endothelium of the liver and bone marrow, the lung appears to play a much more important rôle in this respect than has been hitherto suspected.—*Studies on Endothelial Reactions, vi. The Endothelial Response in Experimental Tuberculous Meningoencephalitis, N. C. Foot, J. Exper. Med., December, 1922, xxxvi, 607.*

Curability of Tuberculous Meningitis.—If any condition in medical experience is generally regarded as constantly fatal, it is tuberculous meningitis. While this applies to the vast majority of cases, there are undeniably a few exceptions. The authors' case was diagnosed not only clinically but by examination of the cerebrospinal fluid. Only one tubercle bacillus was found in two examinations, but the cell counts were 280 and 82 per cmm., respectively, with 60 and 72 per cent of lymphocytes, the Wassermann was negative with both blood and spinal fluid, and injection into a guinea pig caused the production of marked generalized tuberculosis with death of the animal in forty-two days. The patient recovered completely and was still in excellent health eighteen months afterward. A study of both the French and foreign literature disclosed about 250 observations of cured tuberculous meningitis. Most of them antedated spinal fluid examination and were diagnosed either clinically or at autopsy after death from intercurrent conditions. There were found, however, 45 cases of such cure, apparently authentic, in which the diagnosis was made bacteriologically. The authors' case makes the forty-sixth case. Of these, 2.5 per cent occurred before the age of two and a half years, 15 per cent between two and a half and five years, 27.5 per cent from ten to twenty years, and 30 per cent above twenty years. Cure was slow and gradual in all; the longest persisting signs were stiff neck, Kernig sign and headache. Clinical cure usually preceded the anatomic. When the authors' patient was apparently well the fluid still contained 0.8 per 1,000 of albumen and 44 cells per cmm. Six weeks later the albumen content was normal but there were still 10 cells per cmm. From the standpoint of demonstration of bacilli the 46 cases are divided into three groups: (1) tubercle bacilli found in cerebrospinal fluid, without inoculation into a guinea pig or with inoculation and negative result, 25 cases; (2) no bacilli found in spinal fluid, guinea pig inoculation positive, 14 cases; and (3) bacilli found in cerebrospinal fluid, and guinea pig inoculation also positive, 6 cases. Differences in the number of bacilli in the various cerebrospinal fluids make it very

difficult to link up the favorable outcome with this factor; also, the lack of uniformity in the course of the disease in the inoculated guinea pigs precludes any conclusions as to virulence of the microörganisms. There are, however, five principles which in combination are of favorable import: 1. Above all, the primary tuberculous focus must be relatively unimportant and there must be no serious secondary localizations in addition to that in the meninges. 2. The most favorable anatomic forms are the meningitis in plaques, the diffuse congestive form, and discrete or migratory miliary disease of the meninges. 3. The absence of hypertension of the fluid is frequently of good omen. 4. Attenuated virulence of the bacillus is the determining factor in some favorable results. 5. The terrain, only those individuals immunized or vaccinated by one or more previous attacks of the disease being susceptible of cure. With regard to ultimate results in these cases, 20 per cent of them died with relapses, and probably this figure is too low. Cures cannot be regarded as complete until several years shall have passed. As to treatment, none is successful. In the authors' case it was a matter of individual resistance and the benign character of the primary focus of infection.—*La méningite tuberculeuse est-elle curable? (Étude d'ensemble à propos d'une observation récente de guérison), A. Cramer and G. Bickel, Ann. d. Méd., September, 1922, xii, 226.*

Meningeal Tuberculosis and Brain Softening.—Cornil and Robin reported meningeal lesions and cerebral softening in a weakminded patient of thirty-four, who died of pulmonary tuberculosis after having gone through several attacks of melancholia and presenting some Jacksonian symptoms toward the end of his life.—*Tuberculose meningeal et ramollisment cerebral, Cornil and Robin, Soc. d. Neurologie, Paris, Reported in Presse Méd., August 5, 1922, xxx, 672.*

Tuberculous Myelitis.—Beriel and Morenas have studied a series of cases, including nervous complications, of Pott's disease, meningeal myelitis secondary to clinically latent, vertebral osteitis, and intramedullary tuberculosis. The evolution differs in the meningeal forms and in primary tuberculosis of the interior of the cord. In making a clinical diagnosis the signs of evolution should be considered.—*Sur evolution anatomique et clinique des tuberculoses meningomedullaires, Beriel and Morenas, Meeting Soc. Méd. d. Hôpitaux d. Lyon, April 25, 1922, Reported in Presse Méd., May 6, 1922, xxx, 394.*

Acute Tuberculous Myelitis Secondary to Vertebral Caries.—A man of twenty-three, in apparently perfect health, developed a paralysis which became total in thirteen days. Death took place thirty-three days after the appearance of symptoms. Autopsy showed an extradural tuberculous abscess, at the level of the sixth and seventh dorsal vertebrae, and a superficial caries of the vertebral layers, with inflammatory degenerative lesions of the cord. The bony lesions, very superificial, had produced no trouble of posture or movement. Syphilis and gonorrhea were eliminated.—*Myelite aigue tuberculeuse secondaire à une carie latente des lames vertebral avec absces extradural, Garnier and Cathala, Soc. Méd. des Hôpitaux, July 28, 1922, reported in Presse Méd., August 2, 1922, xxx, 662.*

Infectivity of Lupus Vulgaris.—Thirty-three cases of ulcerating lupus vulgaris were used for the following experiments: (1) The scales, crusts, pus, and blood-free serum of the ulcerating cutaneous surfaces and mucous membranes were injected into guinea pigs subcutaneously. (2) Guinea pigs were injected with the granulation tissue and the blood exudate of the above named surfaces in a similar manner. The following observations were made: (1) The injection of crusts and pus of ulcerating cutaneous lupus into guinea pigs was negative. (2) The superficial granulation tissue of ulcerating lupus when injected subcutaneously into guinea pigs led to tuberculosis in 90 per cent of the cases. (3) Similar results were obtained with ulcerating lupus of the mucous membrane of the nose. (4) The treatment of crusts and granulation tissue of ulcerating lupus vulgaris with 15 per cent antiformin for one to two hours frees them from contaminating bacteria and yet does not affect the virulence of the tubercle bacilli. The author concludes from these observations that the general belief that ulcerating cutaneous lupus as well as that of the mucous membrane of the nose does not possess any considerable contagious power, is confirmed experimentally.—*Experimentelle Untersuchungen über die Kontagiosität der Lupus vulgaris, K. Burchard, Deutsch. med. Wchnschr., February, 1922, xlviii, 185.*

Diagnosis of Skin Tuberculosis by Dermatoscopy.—With the slit-lamp microscope, examinations of living intact skin may be made, giving magnifications equal to those of a low-power microscope. By its means circulating blood pigment and papillae may be observed in the living skin. Owing to the rarity of skin tuberculosis in the neighborhood of Houston, Texas, there

was no opportunity to make a differential diagnosis of the two diseases in which dermatoscopic examination is said to be most valuable, namely, lupus vulgaris and lenticular syphilides. Saphier says that these are to be distinguished by the appearance of the blood vessels. In the lupus nodule are "numerous branching vessels forming branch-like (dendritic) ramifications. . . Numerous fine anastomoses connect these vessels to each other and with deeper invisible vessels." The lenticular syphilides have "numerous expanded capillary loops. The dilation, as a rule, is quite considerable; so that the lesion is sharply defined from the surrounding tissue. Moreover, we do not find the dendritic ramifications as in lupus vulgaris." A typical case of lupus erythematosus was examined. The distinctness of the blood vessels and the unusual transparency of the tissues showed that atrophy was taking place—a fact, that could not be decided by an ordinary examination. Improvements in the dermatoscope will doubtless soon increase its value as a diagnostic tool.—*Dermatoscopy, J. C. Michael, Arch. Derm. & Syphilol., August, 1922, vi, 167.*

Type of Tubercle Bacillus in Lupus Vulgaris.—An English tuberculosis commission in 1907, under Foster and Sims, announced their findings in regard to the causative factor of lupus as follows: Out of 20 cases of lupus vulgaris, 11 were caused by the human tubercle bacillus (55 per cent); 9 by the bovine bacillus (45 per cent); 8 bovine and 9 human cultures showed, however, variations in their cultural behavior from that of typical bovine or human bacilli. A number of German observers in 23 cases give the human tubercle bacillus as the sole causative agent of lupus. Rothe and Bierrote, in examining 28 cases, reported 23 (82.1 per cent) due to human bacilli and 4 (14.3 per cent) to the bovine type. In one case, specimens of tissue from two different lesions gave in one the human and in the other the bovine type. The author reports the results of examination of 36 cases of lupus. Sections of lupus tissue were inoculated subcutaneously into guinea pigs. Results were negative in 13 (36.1 per cent) cases. In positive cases, a cultural study and inoculation of rabbits, with the caseous material obtained, revealed the human bacillus in 11 (47.8 per cent) cases and the bovine in 12 (52.17 per cent). Of the 11 patients with human bacilli, 6 were males and 5 females, with an average duration of the disease of six and a half years. Of the 12 patients with bovine bacilli, 3 were males and 8 females, with an average duration of the disease of 9.7 years.—*Experimentelles zur Prüfung der Frage inwieweit der Lupus auf humaner oder boviner Infection beruht, M. Kirschner, Ztschr. f. Tuberk., 1922, xxxvi, 482.*

Treatment of Lupus with Living Human Tubercle Bacilli.—In a case of extensive facial lupus of progressive type in a sixteen year old girl, cutaneous inoculations with living human tubercle bacilli resulted in a favorable outcome. The lupus involved the greater part of the face, lips, nose, lids, cornea, conjunctiva and forehead. The Wassermann reaction was negative. Tuberculin (O.T.) skin tests were negative three times. The patient was then inoculated with human bacilli. They produced a marked reaction with rapid healing in six weeks, with only a slight lid affection remaining. The cutaneous reaction with O.T. was now strongly positive. In treating with living bacilli it is necessary to use a weakened virus and such are obtainable from chronic skin tuberculosis cases. Over 50 such inoculations have been performed by Wichmann, and he designates them as harmless. Material obtained from the lungs would be unsuited for the inoculations. Two advanced phthisis cases were treated with cultures from their own sputum and the reactions were of negative value. The boy from whom the above culture was obtained gave a strong allergic reaction to his own strain.—*Gesichtslupus, Wichmann, (Ärtzl. Ver. Hamburg, Sitzg., May 5, 1921, iv), Abstract obtained from Zentralbl. f. d. ges. Tuberk-Forsch., July, 1921, xvi, 99.*

Treatment of Lupus Vulgaris with Cuprodermasan.—*Cuprodermasan* is a soap preparation of salicylic acid and copper, containing 2 per cent of copper oxide. A combined treatment by *Cuprodermasan* and light (the light used is not given) produced very satisfactory cosmetic effects in selected cases. This shortens the time of treatment very materially as compared with light therapy alone. Many cases have been free from recurrence for five months. No relapses have been noticed thus far. *Lekutyl* has also given satisfactory results; but *Cuprodermasan* has the advantages of being less irritating to the epithelial layers of the skin and of being far less painful. Therefore, it is most valuable in the treatment of lupus vulgaris of the face. It was also tried on a secondary syphilitic papule and on an ulcerative serpiginous syphilide. The effect was almost identical to that with the tuberculous lesions. The perivascular infiltrations were chiefly affected by the preparation which seemed to

destroy the former quite markedly. The copper preparation has no selective action for tuberculous lesions but affects any cellular infiltration.—*Behandlung des Lupus vulgaris mit Kupferdermasan, S. Rothman, Zeitschr. f. Tuberk., July, 1922, xxxvi, 342.*

Phlebitis Tuberculosa Nodosa Cutanea.—Four cases of a new form of tuberculous phlebitis of the subcutaneous vessels is reported. Pathological examination revealed this to be tuberculous. It consists of an elevation of the skin having the same color as normal skin. There was no pain, but, if it developed rapidly, the skin over the foci presented a red color and was painful to pressure. Histologically, it consists of a spingle-shaped thickening of the vein, whose lumen is filled with thrombi, and in the wall are found tuberculous foci. In two cases, tubercle bacilli were found in the foci, but animal inoculation proved negative. The patient lacks tuberculosis symptoms, but the Pirquet test was always positive, with a negative Wassermann. Other luetic symptoms were absent. Clinically, as well as histologically, this is a clearly distinguishable form of disease from Bazin's disease, and thus constitutes a new disease entity.—*Phlebitis Tuberculosa Nodosa Cutanea, Keizo Dohi and Takashi Hashimoto, Hifuka Hitsunyokika Zasshi, April, 1922, xxii, no. 4, Abstracted from Japan Medical World, September, 1922, ii, 265.*

Superficial Phlebitis of Upper Extremities Complicating Tuberculosis.—The literature on phlebitis complicating tuberculosis usually describes lower extremity phlebitis involving the deeper veins, and, clinically, of the form of *phlegmasia alba dolens*. Here are described three cases differing widely from the classical type, in that they were of the upper extremities and involved only the superficial veins of the elbow and forearm. Locally, the picture was of an inflammation, there being redness, painful induration on palpation, some puffiness about the veins, and, in one case, a lymphangitis with swelling of the corresponding epitrochlear lymph node. Several veins were affected simultaneously or successively, and the two arms were involved one after the other. The symptoms were slight, rather fleeting in character, not accompanied by any change in the general condition, and without fever. These superficial types are regarded as, essentially, merely episodes in the course of the disease, and without serious consequences; they are only rarely reported but are probably not seldom overlooked. They are thought not to produce emboli, but, nevertheless, should not be neglected in this respect. Such cases are ordinarily due to the tubercle bacillus, but in the three cases cited the bacillus was isolated only once. All three cases died, but autopsy was possible in only one. Here the reaction was lymphatic in character, without tubercle formation, was non-obliterating and was located in the depth of the wall of the vein.—*Les phlébites superficielles des membres supérieurs chez les tuberculeux, L. Bernard, M. Salomon and Coste, Ann. de Méd., November, 1922, xii, 346.*

Treatment of Surgical Tuberculosis.—About 40 cases of surgical tuberculosis at Robroyston Hospital for Tuberculosis, Glasgow, were given injections of trypsin with no demonstrable beneficial effects. In Glasgow, due to the inclemency of the weather, it is not possible to treat patients with sun baths as faithfully as could be desired. Rollier's technique, slightly modified, was employed and, although the results were not as spectacular as described by him, some beneficial results were noted. Patients with sinuses had the wound exposed to the sun under a thin layer of gauze. There was no casting off of sequestra or shelling out of diseased lymph nodes. As regards the relation between pigmentation and cure no conclusions were drawn. In several cases of cold abscess simple repeated aspirations were not effective in preventing sinus formation. The results of open operation, by which the abscess cavity was exposed by a long incision, its whole lining carefully cleaned away, the walls swabbed with ether, and the wound completely sutured, were successful in about one-third of the cases. The scar would break down and a sinus would develop leading to a bony focus. The best results were obtained from modifying fluids and of these the most useful is the solution of iodoform in ether and oil with creosote and guaiacol as recommended by Calôt. The treatment of sinuses is one of the most difficult problems. In the grossly infected cases free drainage, sun and hygiene is the only effective therapy except in afebrile cases where Calôt's paste is a great help. Due to this, 21 out of 41 cases were healed, 16 improved and in 4 the course is incomplete. Two cases of hip disease of two years' duration healed after a single course. Deep X-ray therapy produces good results in tuberculous lymph nodes, but its effects on bone tuberculosis are still to be ascertained. The treatment of syphilis by drugs, in conjunction with surgical tuberculosis, must be given with great care and in small doses. A very important part of the treatment of abscesses and sinuses

is the immobilization that is obtained by suitable extension or plaster apparatus. The treatment of surgical tuberculosis must be essentially conservative. In hospitals where one has not the most favorable climatic conditions, operative interference combined with general treatment will give the most speedy, although perhaps slightly less perfect, results.—*Some Aspects of the Treatment of Surgical Tuberculosis, J. Taylor, Brit. M. J., October 21, 1922, no. 3225, 746.*

Treatment of Pulmonary Tuberculosis.—The measures that are generally recognized in the treatment of tuberculosis include open air, a sufficient supply of adequate food, sun, air and water baths, rest when the disease is active, exercise when the disease is quiescent, provided there are no other contraindications, medicinal tonics, measures which are directed against harmful symptoms and complications, psychotherapy and artificial pneumothorax. In early disease it is comparatively simple to keep the organs of the body functioning in a natural way, but in the more advanced stages other factors such as toxins, reflex impulses, and anatomic and psychic changes complicate the problem. Rest is always advisable when the disease is active and when exertion produces symptoms assignable to the action of toxins. Exercise is indicated in quiescent disease when such symptoms are not produced and normal physiological processes are not disturbed. Hydrotherapy may be useful in selected cases in all stages. Full sunlight for a portion of each day can be given with great benefit to all nonfebrile patients and even to some who have slight elevation of temperature, and air and light baths can be used very generally. There are three outstanding measures in the treatment of tuberculosis when the toxic stage has been reached, namely, rest, artificial pneumothorax and alkalis with large quantities of water. It is to be remembered that fever is only one of the manifestations of toxemia; malaise, lack of strength and endurance, nervous instability, loss of appetite, decrease in motility and secretory activity throughout the digestive system, and rapid heart action are all toxic effects. One of the chief effects is an interference with oxidation and the retention of acid in the tissues. This disturbs the acid-alkali balance of the body cells and produces an increase in their water-binding power; as a consequence according to Balcar, Sansum and Woodyatt, there is a rise in temperature. Rest is one of the most effective means of restoring normal acid-alkali balance; exercise increases oxidation, resulting in a storing of acid in the tissues, and this therefore tends ultimately to add to the deleterious effects of toxemia. When intelligently applied, rest is unquestionably the most effectual remedy that we possess in the treatment of tuberculosis. Artificial pneumothorax is particularly beneficial in cases of rapidly spreading caseation, but no lung should be compressed unless the other will be fully competent to carry on the requirements of respiration. To restore the acid-alkali balance in cases of toxemia, alkalis and water have been used. Ten to 15 glasses of water a day have been beneficial, but the impression has been gained that 4 to 6 gm. of sodium bicarbonate daily, taken with the free use of water, gives better results. In some instances the rectal bicarbonate drip (3 per cent) has been used for a period of four hours daily for a month or six weeks without interruption. As a rule, however, it is used for about two or three weeks, then interrupted and resumed again. Glucose was added sometimes but proved too irritating for continuous employment. A purified product of soda should always be used. It may be tried, not only in the profoundly toxic cases, but also in those with milder manifestations. Alkalis, when administered, will combine with the acid radicles of the tissues and set water free, thus relieving the cells and increasing the free water reserve of the body. The administration of tuberculin to tuberculosis patients sets up a focal reaction and this is the foundation for its healing properites when given in therapeutic doses. By using tuberculin we can hasten the formation and increase the amount of fibrous tissue about the tubercle, and produce a firmer and more lasting scar in which to encapsulate or bury the tubercle bacilli. This can be done without risk, since all suggestion of reactivating quiescent foci and causing a spread of the disease presumes upon the wrong use of the remedy. Tuberculosis should be treated early and for a sufficient length of time. Six months or more of hygienic treatment are required to insure a good result; a period of three months is wholly inadequate. On the part of the patient, an intelligent appreciation of the disease and the conditions to be met with in its cure, and a willingness and active, aggressive desire to coöperate are among the greatest aids to healing.—*Present Status of the Treatment of Tuberculosis, F. M. Pottenger, J. Am. M. Ass., August 26, 1922, lxxix, 728.*

Management of Advanced Pulmonary Tuberculosis.—In spite of the many discouragements, there is much that can be done in many cases of far advanced pulmonary tuberculosis if they are intelligently studied. In taking the history it is important to

ascertain how the patient became exposed to infection, when and where he became infected and why he became an advanced case. In all cases, and especially in those applying for government aid (in England), it is essential to know the duration of the disease. In the absence of marked physical signs of general emphysema and chronic bronchitis, and with tubercle bacilli in the sputum, it is safe to say that the patient had pulmonary tuberculosis when the continuous cough started; in cases of emphysema and bronchitis with recurrent winter cough this factor is not dependable. A history of anorexia, insomnia of an unknown cause, a period of aphonia, lassitude after slight exertion, excessive sweating during exercise, or even without exercise or during the night, and short bouts of fever with influenzal symptoms, in the absence of an epidemic of influenza, are suggestive of early pulmonary tuberculosis. Gassing does not seem to be an important factor in the onset of the disease. Even with advanced lesions a comparatively good prognosis is sometimes justified. Factors are considered that render the outlook unfavorable, and it is noted that, in addition to physical signs, one must consider the history, symptoms, amount of sputum, temperature, pulse and general condition. The presence of an infected larynx does not necessarily mean a bad prognosis, since this condition generally varies directly with the extension or arrest of the pulmonary lesion. Spinal complications are unfavorable. Abscesses in various parts, such as the ischiorectal fossa, cervical lymph nodes, ribs and testes, do not generally alter the prognosis. Regarding treatment, patients with unfavorable prognosis should not be held under any restrictions and they should be allowed to enjoy as far as possible the short period of life remaining. In the case with a good prognosis, the plan of treatment should be explained. If there is fever the patient should be kept at absolute rest for from twelve to fourteen days; if he shows no improvement in this time, the prognosis must be changed and the patient allowed full liberty. In some cases artificial pneumothorax or autogenous vaccines are helpful. If the patient improves under ordinary rest treatment he must be kept at absolute rest until his temperature has been normal for at least three days; then gradually increasing stages of activity may be allowed. In advanced disease, however, the patient must be allowed certain discretions in regulating his exercise. Usually such a patient's activity is sooner or later limited by dyspnea on exertion. After he reaches the limit of ordinary exercise he should be assigned to some form of light work not necessarily out of doors. Other advanced cases become able to undertake more strenuous employment. Under supervision, these patients may work without harm, but often they return to their homes against advice and usually, in such an event, the disease soon relapses. The causes for these relapses are: 1. The difficulty of obtaining work in which the patient can rest when he feels tired and take days off when necessary. 2. The unsuitable housing conditions to which the patient returns after the sanatorium. 3. The struggle for existence. 4. Insufficient medical attention. A far more efficient domiciliary treatment is needed in England for patients discharged from a sanatorium. The present system is useless for cases with progressive lesions and the colony system is considered the most favorable for treating the advanced case with a good prognosis.—*A Few Observations on Cases of Advanced Pulmonary Tuberculosis, F. R. G. Heaf, Tubercle, November, 1922, iv, 49.*

Telling Tuberculosis Patients the Truth.—Shall the hopeless third stage patient be told the truth? Shall the nervous, egotistical incipient case be told the truth, and be subjected to the risk of being frightened into a more serious condition? If we eliminate hope from our treatment we have taken away one of our strongest natural weapons of defense. But in order to defend themselves patients must know the truth. How can a patient intelligently combat a trouble without knowing what it is? *Conclusions:* The medical man who does not tell his patients the truth is guilty of a crime just as truly as any criminal is guilty. The doctor who puts the truth in as attractive a form as possible is doing this class of patients the greatest amount of benefit. To do this he must first gain the patient's confidence; then slowly but surely put him face to face with the truth. If he then leaves us we have done our part. We have upheld the honor of the profession if we have done the very best as we see it. We shall have done something worth while and with time will be rewarded by a profitable following and, best of all, by a clear conscience.—*Shall We Tell Our Tuberculous Patients the Truth? A. Minnig, N. York M. J. & Med. Rec., January 3, 1923, cxvii, 27.*

Duration of Sanatorium Treatment.—In advising a patient with tuberculosis how long he should remain in a sanatorium, diverse factors have their influence. These include financial considerations, the patient's character, his home conditions and his business, self-deception and bias on the part of the doctor, and suspected selfish motives

in his desire to retain the patient. It seems, therefore, that it would be much more satisfactory, both for sanatorium patients and doctors, if the question of the patient's discharge were settled month by month, by an outside specialist, selected by the patient, preferably a specialist with personal experience of open-air treatment. Such transference and delegation of responsibility would deprive the patient of the sanatorium doctor's prognostic experience and would partially deprive the doctor of his right to give a prognosis; but the gain in peace of mind for both patient and doctor would more than compensate for these deprivations.—*Duration of Sanatorium Treatment, R. C. Macfie, Tubercle, December, 1922, iv, 111.*

Tuberculosis Colonies.—Before the establishment in England of colonies as a result of an experiment at Papworth, it was possible to treat only acute and active cases of tuberculosis. As soon as he began to feel well, the patient left the sanatorium and returned to his employment, where he soon suffered the usual relapse. It has been shown that the first year after discharge from the sanatorium is more critical for the patient than the second, and the second is more critical than the third, and so on. Consequently, the colony's endeavor should be to obtain extended treatment, so that there may be a more permanent result in a bigger percentage of cases; but, to persuade the working man to undertake this extended treatment, some definite object other than simply health must be shown as his asset. Cottages and villages for the tuberculous, as a method of attacking the problem as a whole, are far too expensive. The colony must therefore be a part of a chain of institutions which deal with selected cases in the varying stages of their career from sickness to health. Selection must be rigid, so that each type of institution, as hospital, sanatorium or colony, shall treat only the type of case for which it is specially adapted, the patient being passed on as he improves. In this way he becomes interested, and hopeful that he will be restored to a profitable existence. After the colony the patient should not be pushed unprotected into ordinary industrial life, since the suddenly increased strain is liable to be too great, and since conditions of training for a new trade are often ill adapted to the problem. Obviously, the man cannot spend the usual four to seven years to learn a trade, and trade unions will not recognize him if he does not. It is advisable, therefore, for these men to take up very simple work, which may be monotonous, but profitable and not too strenuous. Simple carpentry, chicken farming for egg production, and boot repairing are suggested to start with. It is necessary first to secure the man's cooperation and, to do this, his business should be conducted for him, his raw materials bought in the best market, and his finished products marketed for him. To give the protection needed after leaving the colony, "municipal workshops" are suggested. These would be located in industrial areas, where a man still handicapped by his disease could work according to his limitations of time or strength, under good conditions, and where a business management would secure him a satisfactory return for his effort. The danger of infection in such a scheme has been given too much prominence, which diverts attention from the problem of concentrating on the recuperative cases. Workshops would be under medical supervision, business men would help as needed, the man's family would be aided financially, and, finally, in many instances the man could return to ordinary industrial life. At present the various agencies of the antituberculosis campaign are not properly coördinated in England. *Conclusions*: 1. The colony offers a period of extended treatment, each month of which reduces materially the danger of relapse. 2. The colony is a stepping stone between sanatorium and home. 3. The colony must not be an isolated institution, but must work in harmony with the public health authorities and find its appointed place in the whole problem. 4. Some form of protection is needed after colony treatment is completed. 5. The municipal workshop offers the possibility of this protected labor in a large number of cases, and in rural communities a coöperative system of marketing the goods made by patients in their own homes is essential. 6. The village settlement offers but limited help, and a method of dealing with individual cases (that is, the very infective) is too expensive to be of material assistance in the whole problem. 7. The industrial colony life reëstablishes the mental as well as the physical well-being of patients, fostering initiative and bringing the men out of the hopeless attitude which continuous unemployment has caused. 8. Although initial results may be small, they will increase with time and experience.—*The Position of the Colony in the Tuberculosis Campaign, S. Tinker, Tubercle, December, 1922, iv, 97.*

Climatic Treatment of Pulmonary Tuberculosis.—There is considerable disagreement on the value of climate in the treatment of tuberculosis. It is significant, however, that the difference of opinion is largely limited by geographical lines; that is

to say, that the great majority of propagandists of certain climates are usually residents of those climates. The ideal climate for the treatment of tuberculosis would be one of cool temperature with moderate diurnal variations in temperature, a dry atmosphere with gentle breezes, free from impurities, and at a moderate altitude. However, none of the recommended climates meets these conditions throughout the year, nor throughout the day. In the opinion of trustworthy authorities, tuberculosis is harmfully influenced by high altitudes. It is no longer necessary to defend the statement that tuberculosis can be successfully treated in any climate. The following cases are not suitable for high altitudes and usually do better in a low elevation: 1. All unilateral advanced, active, progressive cases with destructive processes and cavitation. 2. Extensive disease of chronic character. 3. Cases with ulcerative laryngitis, definite intestinal and peritoneal tuberculosis, or persistent diarrhea. 4. Cases with the following nontuberculous complications independent of the stage of the pulmonary disease: cardiac disease, nephritis, albuminuria, arteriosclerosis, diabetes, bronchitis and neurasthenia. 5. Cases without even extensive disease of the lungs, with continued fever or with a pulse of 120 or more when at rest, especially if it is of impaired quality, and those with a tendency to profuse hemorrhages. 6. Cases, even in the early stages of the disease, of the asthenic type, with markedly enfeebled vitality and digestion. Patients in the initial stages of the disease without organic disturbances or functional complications are often helped by a change to a higher altitude, especially after they have not done well at a low one. After a more or less lengthy stay at a high altitude patients, especially those with an advanced lesion, often do badly on returning to a low level. It would therefore be wise to advise these people to remain where they were cured. In general it is best to seek to effect a cure in the climate in which the patient desires to remain. *Conclusions:* 1. There is no definite climate for the treatment of pulmonary tuberculosis; no one climate is suitable for all cases of the disease and it is becoming more and more the consensus of trustworthy opinion that tuberculosis can be treated successfully anywhere under a proper regimen of diet, fresh air, rest and time. 2. There is no conclusive evidence to lead us to suppose that a high altitude is of any specific influence in the disease. 3. On the contrary, the majority of the tuberculous, and particularly those in the advanced stages, are harmfully influenced by altitudes above from one to two thousand feet. 4. Indigent consumptives, especially those in the advanced stages of the disease, should not be sent to high and distant climates. 5. It is important that these facts become more common knowledge among the physicians and the laity.—*Climate in the Treatment of Pulmonary Tuberculosis, H. Schwalt, New York M. J. & Med. Rec., January 3, 1923, cxvii, 32.*

Mountain Climates for Tuberculosis.—The following advantages are enumerated after extensive discussion of the subject: Absence of high temperature in summer, slight humidity and increased radiation from the skin and lungs, the beneficial effect of the low barometric pressure on the hematogenic organs, the opportunity of taking sun-baths without increasing the body temperature and the increased amount of ultraviolet rays in the spectrum.—*Einige kritishe Bemerkungen zu den Klimabeobachtungen in Kurorten des Hoch und Mittelgebirges, C. Flügge, Zeitschr. f. Tuberk., October, 1922, xxxvii, 1.*

Alpine Climate in Treatment of Tuberculosis.—Advice as to where a tuberculosis patient should go should be based upon actual knowledge of the physical and mental characteristics of the patient, as well as his disease; also as far as possible on actual knowledge of the climatic conditions in particular regions under consideration. First of all must be realized how largely success in treatment depends on the interaction between the mental and physical powers of the patient and the various therapeutic agents in his surroundings. Some patients are better treated at home, supported by the accustomed presence of relatives and friends; others, especially in the early and more curable stages, would be better off at a suitably chosen resort. There is little sense or reason in the oft-repeated statement that a patient should seek cure in the place where he has afterwards to live. In summarizing the special physiological changes that result from residence at a high altitude, reference is had especially to the writings of Huggard and Leonard Hill. Briefly, these are a feeling of stimulation, a deepening of respiration, an enrichment of the blood in hemoglobin and probably an augmentation in volume, together with a relative lymphocytosis. The drier, rarer atmosphere has a stimulating effect on the mucous membranes, which are probably subjected to a greater flow of blood and lymph. The marked diurnal temperature changes exert a powerful effect in stimulating metabolism (difference of 50 degrees between sun and shade is not uncommon),

and this may have a general tonic effect. Heat production may be raised from 40 to 90 per cent. The effects of heliotherapy are particularly marked at high altitudes. Roget has stated that at sea level 32 per cent of the heating effect of the sun is lost, whereas at a height of 3000 metres the loss is only 11 per cent. In winter the sun's power is greatly enhanced by reflection of its radiant energy from the snow fields. Both the local and general effects of exposure to sunshine are to be considered. Tanning of the skin has often been found to be associated with the amelioration of morbid conditions of internal organs, which may not occur in those who do not tan. On the other hand, exposure to the sun may be followed by an exacerbation of signs or symptoms in pulmonary tuberculosis similar to a tuberculin reaction. These considerations indicate that heliotherapy is a double-edged weapon. Its biophysics are obscure. Malgat states that some rays may pass through the body and affect a photographic plate on the other side; there is also a possibility of the pigment transforming the short-wave rays into longer-wave rays. Exposure to sun and air has a tonic effect on muscle, and sunlight has analgesic and bactericidal properties of therapeutic importance. The psychological effect of sunshine is also not to be ignored. The psychological effect of the Alpine scenery and environment generally, as exemplified at such a resort as Montana, is more important than generally recognized. Letters from a number of patients are quoted to emphasize this. In winter, when the climate of the British Isles is at its worst, Switzerland presents special advantages: it has a longer period of sunshine, even on the shortest day and a drier atmosphere, and places can be found at such an elevation that no fog obscures the sunshine. When health and work occupy the individual, he pays little attention to the absence of sunshine, but in a tuberculous person with weakened vitality there are produced depression, malaise, and often chilling; therefore, it is our duty to establish such invalids in the sunniest climate possible. Tuberculosis in all its forms is without doubt considerably influenced by climatic conditions; indeed, it is not too much to say that climate may be a deciding factor in its course. Cases must, however, be carefully chosen, and it is the reasonably early cases with still plenty of vigor who respond best. It is useless to send to the mountains persons enfeebled and emaciated, with no power left, nor should patients in the early and acute stages of activity be sent away, as a rule, until the acute process has settled down. Absolute rest in bed should be instituted at once in these cases. Old-standing cases of phthisis, especially in elderly men with sclerotic changes, should not be sent to a high altitude. Hemoptysis, in young people whose disease is not too far advanced, is no contraindication, and the Alpine climate is very beneficial for the after-treatment of successful cases of artificial pneumothorax. For cases of surgical tuberculosis a mountain climate is eminently suitable, especially during the winter months when heliotherapy can be carried out under the most favorable conditions. Chronic peritoneal tubercle and tuberculous abdominal glands derive much benefit. Abscesses, as a rule, should not be opened; if aspirated at suitable intervals they often absorb and disappear. Cases of lupus and many other chronic skin diseases improve under heliotherapy and at least two cases of double renal tuberculosis appear to have been greatly benefited. As a general rule, sun treatment should not be used in frank pulmonary cases, but in the so called subtuberculous or pretuberculous type of cases, in backward children with adenoids, debility and a tendency to colds, it is eminently suitable. Bronchial asthma and catarrh in young persons usually respond favorably, but in old people with emphysema or long-standing phthisis the results are not good; in these the power to respond to a cold dry climate is often lost and too great a strain is thrown upon the heart. Regarding catarrh of the upper air passages, if the mucous membranes are in a hyperirritable condition the dry cold serves to aggravate and increase the discomfort. Cases of hay fever, however, often make a remarkable recovery. Cases of general debility and anemia usually do remarkably well if uncomplicated by organic or systemic disease. The obese should benefit from the accelerated metabolism, but unfortunately they are usually also endowed with flabby wills and cannot bear to give up indulging themselves. Regarding cardiac cases, as a general rule, patients with uncomplicated valvular lesions should not be sent to a high altidude; with a severe lesion, even if compensated, ascent to a height may cause a breakdown. Patients with marked hypertension and arteriosclerosis should not be sent to the mountains. Mountain sickness and hill diarrhea need not be touched on, as they do not occur under heights of 10,000 or 12,000 feet. Regarding nervous disorders, there is a type of person in whom long residence in a mountain climate appears to cause restlessness, irritability and insomnia, perhaps mild psychoneurosis. These people should be sent away for a period; they may then be able to resume their cure in contentment for another period. Among the Swiss health resorts devoted to

the treatment of the tuberculous, Montana, situated in the Upper Valais at an altitude of 4920 feet, on the slopes of the Rhone Valley, deserves a foremost place. It has the highest record for sunshine and is so situated as to be protected on the north but open from the south. Other well known stations to which English patients are often sent are Leysin, above Aigle in the Rhone Valley, the site of Rollier's famous clinics, and Davos and Arosa in Eastern Switzerland.—*Alpine Climate: Its Physiology and Therapeutics, B. Hudson, R. G. Bannerman and T. N. Kelynack, Brit. J. Tuberc., October, 1922, xvi, 11.*

Fibrosis of Lung Following X-ray Treatment.—The condition of the lungs in a case of secondary sarcoma indicates that normal lung tissue may become the seat of pathological fibrosis as a result of intensive roentgenization. In a case of secondary carcinoma of the lungs, treated less intensively, extensive infiltrations were encapsulated by fibrous tissue.—*Fibrosis of the Lung Following Roentgen-Ray Treatments for Tumor, L. E. Hines, J. Am. M. Ass., August 26, 1922, lxxix, 720.*

Radium Treatment of Tuberculous Lymph Nodes.—The surgical and medical treatment of tuberculous adenitis had been so unsatisfactory generally that in 1913-1914 it was decided to try radium. As a result it is thought that the day of radical operation will soon be past; also the necessity for long sojourns at the seaside, which often seriously interfere with children's education, and the unsightly scars that disfigure the neck. With radium, in no case was a scar left except where suppuration had already occurred. The one disadvantage is the initial cost of the radium and the damage to applicators. No sign of recurrence has been seen in any treated patient. The gamma rays of radium are those utilized; a silver screen absorbs nearly all the alpha and beta rays. The applicator, properly protected, is strapped to the patient directly over the nodes and left there from four to eight hours in the case of an applicator an inch square. A stimulating rather than a destructive dose is aimed at, to increase the vitality of the tissues and phagocytic activity. Abscesses should be aspirated, not opened, the surrounding skin being painted with 2 per cent picric acid; it is rarely necessary to aspirate over two or three times. Treatment is continued till all signs of disease have disappeared and only tiny fibrous nodules remain. Meanwhile, the patient can go about his activities, only violent exercise, which might lead to blows or pressure, being enjoined.—*Radium as a Curative Agent for Tuberculous Glands, E. S. Molyneux, Lancet, October 14, 1922, cciii, 804.*

Climatotherapy in Hospitals.—Light has a beneficial action upon the blood and accounts for a more rapid regeneration in higher altitudes. The healing action not only depends upon the ultraviolet rays but upon others also. The action of the arc light can be transferred through the medium of the air. If rayed light is inhaled by animals they also regenerate blood quicker. The blood pressure is diminished. Either the ionized air or chemical substances are responsible. It is recommended that where a drop in blood pressure is to be avoided the raying should be done during the administration of fresh outside air. Anemic patients require the arc light air without direct raying to hasten blood regeneration. Patients with high blood pressure are benefited by inhalations of arc light air to reduce the pressure.—*Klimatotherapie im Krankenhaus, O. Kestner, Beitr. z. Klin. d. Tuberk., March, 1922, l, 121.*

Two Manometers for Artificial Pneumothorax Apparatus.—In 1914 an apparatus having two manometers for the induction of artificial pneumothorax was described and the following advantages were claimed for it: (1) ample oscillations are shown throughout the operation; (2) observation of the manometers shows whether the gas is flowing and in what direction, however slow the rate; (3) without cutting off the gas, the intrapleural pressure can be estimated accurately or approximately, according to whether a calculation is made or not; (4) it can be used as a single manometer apparatus. It is possible to convert the ordinary single manometer apparatus into a double manometer one, by inserting the second manometer between a regulating valve and the gas reservoir. The valve can be made from a gas tap. The mode of operation of the apparatus is described in a simple experiment. The use of two such manometers involves certain calculations if accurate readings are required; in lieu of this approximate readings are obtained by estimating differences in rapidity of movement in the two manometers. This is held to be sufficient for practical purposes.—*Two Manometers in the Apparatus for Inducing Artificial Pneumothorax, W. P. Morgan, Tubercle, December, 1922, iv, 104.*

New Contributions to Artificial Pneumothorax.—Much of the value of the great mass of statistics as to artificial pneu-

mothorax is lost. These statistics are full of elements which are not comparable, since different pneumothoraces act upon pulmonary lesions in mechanically different ways. Granted that the lung is held against the costodiaphragmatic walls by virtue of the negative pressure within the pleural sac, let us imagine that we have the means of exactly determining the intrapleural pressure at any moment and that we are creating an artificial pneumothorax in a free pleural space. Little by little the pressure rises until it exactly equals the atmospheric pressure and the manometer oscillates around zero. This degree of pneumothorax does away with the mechanism by which the lung is held expanded and the latter, recoiling on itself by its innate elasticity, is now in a state of almost complete rest. This degree of pneumothorax should be called that of pulmonary rest. If now the insufflation be continued to the point of producing positive intrapleural pressure, pulmonary compression is superadded to the pulmonary rest. The pneumothorax now becomes one of pulmonary compression. These two forms of pneumothorax are quite different; that of pulmonary rest represents merely the natural contraction of lung tissue and the only movement is *en masse* and such as is transmitted by contiguous organs. In the pneumothorax of compression, on the other hand, the lung is perhaps put still more at rest, but it has had imposed upon it a shape, size, structure and circulation different from those assumed when the retraction is simply that of natural elasticity. It is absolutely indispensable that we be able to determine the instant when the first of these forms passes into the other, and we must, therefore, be able to determine intrapleural pressure exactly; such a determination is also necessary for the reason that it is the sole means of knowing the degree of compression exerted upon the lung and mediastinum. Not seldom a thickened pleura obscures the radiographic picture to the point of leaving one at sea as to the degree of compression. The practice of accepting the mean of the respiratory oscillations as the measure of intrapleural pressure is wrong for several reasons; first, because the amplitude of manometer oscillations depends on the manner in which the patient breathes, which latter element is profoundly influenced by various psychic factors; also, by the fact that though two given patients may show the same extremes of oscillation, the respiratory rate is quite different and the period of maintenance of the pressure of either one of the extremes is very different. The two forms of apparatus most widely used in France to-day are those of Kuss and of Bertier, both designed to give exact intrapleural pressure but both having faults. To overcome the latter the compensating manometer of Marey, recently proposed for determining the actual mean tension of the blood in the arteries, has been employed. It is linked up with the old artificial pneumothorax apparatus of Leuret and with the ordinary manometer. The manometer of Marey by virtue of a contraction at the base of the tube does not oscillate like the ordinary manometer, but gives a true pressure figure which the authors call the effective pleural pressure (*pression efficace intra-pleurale*). This pressure is defined as that which, acting continuously upon a lung placed theoretically in an immobile thoracic cage, would cause that lung to be in the same state of distention or compression as that produced by the corresponding variable pressure, due to the play of ribs and diaphragm. Through the ability to determine quickly the exact intrapleural pressure after the introduction of successive quantities of gas, 100 cc. for instance, curves can be plotted of which examples are given. Three laws are formulated: 1. A large cavity free from adhesions shows such a curve slowly and regularly rising from the beginning to the end of insufflation. The pressure increase is from 0.5 to 1 cm. of water for each 100 cc. of gas or air insufflated. 2. Small pleural cavities show a rapidly mounting curve, the smaller the cavity the more abruptly the rise of curve. 3. The curve of insufflation in a given subject always remains the same as long as the pleural cavity presents no anatomic change; an alteration in the curve indicates a change in the capacity of the pleural pocket. Further, certain deductions are possible from such curves: a sudden drop in a curve during an attack of coughing indicates that gas has been forced into a new pocket, while absence of change of pressure in the course of insufflation is a sure sign that the needle opening is not inside the pleural sac. The pneumothorax of rest in most cases produces conditions most favorable for healing. The pneumothorax of compression would seem indicated only when the whole lung, functionally speaking, is lost; it might be advantageous here, since the question of uninvolved tissue no longer enters in.—*Données nouvelles sur le pneumothorax artificiel, E. Leuret, G. Aumont and P. Delmas-Marsalet, Ann. de Méd., August, 1922, xii, 110.*

Low-Tension Pneumothorax.—There is an old principle in tuberculosis that fever of more than four to six months' duration rarely disappears and that temperatures

which do not fall during the first few weeks at a sanatorium indicate a bad prognosis. In earlier days such cases, where one lung only was involved, were treated by artificial pneumothorax of the original compression type. In many, foci previously undetected developed in the hypothetically healthy lung, or else intestinal involvement unexpectedly occurred, the result of sudden liberation of toxins by excessive compression. For all cases of bilateral disease the treatment was inapplicable. The marked loss of weight following the anorexia which occurs in cases of pneumothorax was ignored. By the old method 1500 cc. of gas were often given on the first occasion, the patient becoming cyanosed and dyspneic. Both the mechanical disturbances and the flooding of the circulation with toxins were dangerous. It soon became evident, however, that by using small initial doses and low tension the dangers could be averted and no complications were to be feared. Particularly, foci in the opposite lung were not lighted up. This gradually led to the treatment of cases in which both lungs were affected, low tension pneumothorax being induced on the side exhibiting the more active signs. Recent investigations show that artficial pneumothorax is followed by an increase in the red blood cells and hemoglobin. The reduced surface for respiratory exchange may bring about a compensatory increase in hemoglobin, or the result may be affected through changes in the calibre of the blood vessels and widening of the lymph spaces. An important result of this method of treatment is the relief of traction and tension in the affected tissues and stabilization of the lung in the most suitable positions for recovery. It often happens that the gas becomes localized over the affected area, the lung being inelastic over this part. Also, effusions are much less common with low-tension than with compression pneumothorax; in fact, the incidence of effusion is in proportion to the degree of compression.—*Some Observations on Low-Tension Pneumothorax, Gwerder, Tubercle, October, 1922, iv, 13.*

Artificial Pneumothorax with Low Pressure.—The author reviews and clearly defines Gwerder's method of artificial pneumothorax. According to the method, air or nitrogen gas is introduced every five to seven days in small quantities (100–300 cc.). The intrathoracic pressure is negative on both inspiration and expiration. This method is to be preferred to compression with positive pressure at the end of the inspiration and expiration, or to the pneumothorax with positive pressure at expiration and zero pressure at inspiration.—*Zu der Frage des sogennanten Gwerderschen Entspannungspneumothorax, A. Wolff-Eisner, Zeitschr. f. Tuberk., October, 1922, xxxvii, 48.*

Effusions after Artificial Pneumothorax.—Brauer, Spengler, Saugman, Forlanini and others report exudates in 50 per cent of their artificial pneumothorax cases. Rossel noted in the *Sanatorium populaire de Leysin* exudates in 49.9 per cent. He believes that these figures are too low, since all patients, if the pneumothorax is maintained long enough, finally develop an exudate. Etiologically, according to our present day views, the exudate is an inflammatory reaction, a true pleuritis. The pneumothorax exudate gives a positive Rivalta reaction, the protein content is higher than the ordinary exudates and the specific gravity is high. In all infectious diseases an exudate can develop. Brauer and Spengler noted it six days after an angina. The culture of the exudate revealed streptococcus. In another case they found it after a pneumonia on the healthy side; the exudate contained pneumococci. In the majority of the exudates the cause is the tubercle bacillus. The frequency of the appearance of exudates is striking. Lack of complete asepsis has been made answerable but all explanations have not been satisfactory. It is interesting that an exudate never occurs in a case in which an attempted artificial pneumothorax has failed. According to Rossel, exudate formation depends on three factors: the parietal and visceral pleura are widely separated, the nitrogen acts as a foreign body between the two pleural leaves, and, finally, the intrapleural pressure is not physiological. The main cause is to be sought in the separation of the visceral and parietal pleurae. A subpleural tuberculous nodule would not ordinarily rupture freely but would occasion local adhesions in the pleura, but, if the pleurae are separated by the pneumothorax, then the nodule ruptures directly into the pleural space and causes the exudate. That an exudate can form from torn pleuritic adhesions is certain, but it is rare; and the formation of a pleuropulmonary fistula can be of more significance as an etiological moment. Temperature can play only an insignificant rôle. That nitrogen is not an indifferent gas for the pleura and can harm the epithelium is indicated by the fact that after the gas has absorbed the pleural surfaces adhere. The exudate in pneumothorax is to be likened to an exudative inflammation in a joint. The gas acts as a foreign body, irritates the endothelium which

inflames and, as a result, an exudate forms. The pneumothorax pressure presses on the diseased lung tissue, and a tuberculous nodule that is caseating tends to break through the irritated pleura. The incidence of exudates in the advanced cases favors this view. Exudates also occur in pneumothorax patients who have been too active. The diagnosis of pneumothorax exudates is not difficult. They give the same symptoms as ordinary exudates. An important daily symptom is the appearance of amphoric, metallic breathing on the pneumothorax side. A second symptom is chest pain which may occur on both sides and is occasioned by intercostal neuritis. Besides these two cardinal early symptoms there is a third, namely, auscultatory changes on the healthy side, as fine congestive râles, especially in the axillary region. The development of an exudate is usually associated with temperature that is variable in its behavior. The safest clinical test for an exudate is the X-ray. Small exudates are of no significance. Large ones can organize, form dense adhesions and prevent further collapse. According to v. Muralt the exudates can have an autoserum action on account of their antibody content. A danger exists in the formation of a pyopneumothorax. Cytologically there is always a preponderance of lymphocytes over neutrophiles. The criterion for subsequent fillings is the speed of formation of the exudate, the tendency of the lung to expand and the intrapleural pressure. If the exudate is small, refills can be given one week after absence of fever. If the exudate rapidly increases and soon fills the entire pleural space, refills are useless. If X-ray reveals a well compressed lung and the pleural pressure remains positive, no refills are required. If the pleural pressure is negative, refills are required to prevent expansion of the lung. Every exudate of two to three months' duration and sufficient amount, not tending to resorb, should be withdrawn and replaced by gas. Repeated withdrawals of small amounts may be necessary to attain this result.—*La pleurésie séro-fibrineuse. Complication du pneumothorax artificiel, G. Rossel, Dissertation, Lausanne, 1920, Abstracted from Centralbl. f. d. ges. Tuberk.-Forsch., June, 1922, xvii, 600.*

Unusual Complications of Artificial Pneumothorax.—The dangers of spontaneous pneumothorax in the course of artificial pneumothorax are discussed at great length. A case is reported in which a spontaneous pneumothorax was superimposed on an artificial one. The patient developed a dry pleurisy on the untreated side and an effusion on the diseased side, which closed the fistula. —*Zwei bemerkenswerte Komplicationen bei künstlichen Pneumothorax, A. Winkler, Ztschr. f. Tuberk., August, 1922, xxxvi, 426.*

Loss of Weight in Artificial Pneumothorax.—Two theories are advanced to explain the loss of weight that follows frequently the induction of artificial pneumothorax. The first postulates impaired metabolism; for it is not difficult to imagine that the collapse of one lung will cause a general metabolic upset to which the body has to accommodate itself. The diminished oxygen concentration of the blood apparently causes an inefficient combustion of carbohydrates and fats. A consequent demand on the body fats is made by the liver; these respond readily and there is a tendency to fatty infiltration of that organ. Evidence of this is frequently seen at necropsy. As treatment continues, the uncollapsed lung begins to accomodate itself to the changed conditions and a stable metabolism ensues. The second theory is based on the displacement of the mediastinum. In cases observed, when the pressure was reduced and the mediastinum allowed to return toward its normal position, the patients frequently began to gain weight. When adhesions have to be stretched in order to bring about a good collapse, displacement must often be resorted to, even with the strong probability of subsequent loss of weight. As a rule, high intrapleural pressures are not desirable and, if used, should be given with extreme caution. In order to increase anabolism and lower catabolism it is far wiser to keep the patients in bed during the first few weeks of treatment. Later on, carefully regulated exercise or work may be indulged in.—*Loss of Weight in Cases of Artificial Pneumothorax, L. S. T. Burrell and M. Y. Garden, Lancet, cciii, 861.*

Thoracoscopy in Artificial Pneumothorax.—The presence of partial pleural adhesions not only prevents a good collapse of the lung, but is liable to give rise to two troublesome complications later on, by exerting a distorting influence on the mediastinum and interfering with function of the opposite lung, and by inducing a pulling out of the lung at a later stage, with possibly total adhesion, especially likely in cases which develop fluid. The investigation of these adhesions is carried out by fluoroscopy from different angles, and the introduction of the thoracoscope, which is a comparatively simple procedure and is performed under careful local anesthesia preceded by a small dose of scopolamine and morphine. Cau-

terization of adhesions is performed while the operation is observed under the thoracoscope.—*The Use of the Thoracoscope in Cases of Artificial Pneumothorax, S. V. Pearson, Lancet, December, 1922, cciii, 1273.*

Thoracoplasty.—Thoracoplasty is recommended in all advanced unilateral cases of tuberculosis with cavitation, and in all unilateral cases with an unfavorable clinical course where pneumothorax cannot be administered. Its advantage over pneumothorax is that while the thoracoplasty always gives good and permanent results, pneumothorax in cases with cavitation is almost always followed by relapse as soon as the treatment is discontinued. Comparative safety with thoracoplasty is attained only when the operation is done in two stages, with an interval of three weeks. Even in favorable cases, one stage of the operation is likely to be followed by shock. In the first stage the area operated on is from the eleventh to the sixth rib, in the second, from the first to the fifth rib. The incision is made parallel to the spinal column and at an angle of 120° at the tenth rib, where it is carried along that rib.—*Bemerkungen zur Thorakoplastik, F. Jessen, Ztschr. f. Tuberk., August, 1922, xxxvi, 425.*

Treatment of Pulmonary Tuberculosis by Phrenicotomy.—Sauerbruch and others have shown that after a unilateral phrenicotomy the diaphragm stands still in a position of extreme expiration. Brauer thinks that phrenicotomy causes a certain immobilization of the lower lobes but that it is not sufficient to influence the tuberculous process. Felix demonstrated that the insufficient immobilization of the lungs is due to the fact that there is an accessory phrenic nerve present and that the twelfth intercostal nerve supplies motor branches to the diaphragm, and that therefore the phrenicotomy alone does not produce a complete paralysis of the diaphragm. To remedy this they use the following procedure which they term *exairesis*. The nerve is found and cut the same as in phrenicotomy, then the peripheral end is grasped with Thiersch's forceps and very slowly, at one rotation in a minute, rotated. The accessory phrenic arises from the phrenic nerve near the hilum of the lung. If 10 to 12 cm. of the nerve is evulsed, one can safely assume that the tract of the accessory phrenic is interrupted. Theoretically, the procedure might be dangerous, as the pericardio-phrenic artery and the subclavian vein may be injured and adhesions may provoke a reflex irritation on the pericardium and the mediastinal pleura in the process of evulsion, but practically the operation is devoid of dangers, as is shown by their cases. The effect on the lower lobes is greatest; but the upper lobes are also benefited. The other side is also greatly benefited in cases where there was a pull on the other lung by pleuro-pericardial diaphragmatic adhesions. Clinically, loss of fever and marked general improvement resulted in many cases. The operation is done under local anesthesia, the patient complaining slightly of pain in the shoulder blade and dyspnea. Tachycardia was present in 4 cases of the series and lasted five months in one case. Of a series of 7 cases of phrenicotomy and 7 of *exairesis*, 6 improved very markedly, 3 slightly, 4 did not improve at all and 1 only temporarily. These cases were all of advanced pulmonary tuberculosis with considerable involvement of the other side in 12 of the cases. The operation is indicated before every thoracoplasty, because the latter will be aided by the partial shrinkage of the lung attained by the operation. It is also useful as a diagnostic method, to test the state of activity of the other lung when this is desired.—*Über die Bedeutung der Phrenikusausschaltung insbesondere in Form der Exairese für die Behandlung der Lungentuberkulose, H. Alexander, Ztschr. f. Tuberk., July, 1922, xxxvi, 325.*

Light and X-Ray Therapy of Pulmonary Tuberculosis.—The course and character of pulmonary tuberculosis depend on the virulence of the bacilli and resistance of the patient. Only in the course of the disease do "allergic forces" originate and manifest themselves. As there is no specific therapy in tuberculosis, the body must be strengthened so that resistance may manifest itself. Light therapy offers a means of influencing favorably the general condition of the patient. The mildest form of this therapy is the air bath. Next comes the light bath, which is an air bath taken not in diffuse daylight but in sunshine. The peripheral blood vessels first contract, then dilate. Metabolism is accelerated and the heart is greatly stimulated by the action of the peripheral vessels. The automatic regulation of the skin vessels in response to cold and hot stimuli becomes greatly improved. The fallacy of absolute rest cure with neglect of hygiene of the skin is discussed by the author. The only contraindication to light baths is temperature above 37.5°C., when the baths are dispensed with, to be resumed as soon as temperature falls. All the light rays, despite their physical differences, act biologically in the same manner, in that they stimulate the internal organs and the diseased foci, and in this way raise the immunizing processes

of the body. Sunlight therapy is also very important for prophylaxis in those who have recovered clinically. Of artificial lights the most satisfactory is the quartz light. General radiation with the quartz lamp is very beneficial in cases where the bronchial mucosa is most affected, as in chronic bronchitis. Hyperemia of the general body surface relieves the congestion of the bronchial mucosa. The X-ray is being employed more and more in all forms of tuberculosis. The best results are achieved with it in cases of pulmonary tuberculosis. Tuberculous granulation tissue is a radiosensitive tissue. The rays at first stimulate it; then injure and finally destroy it; while the normal lung tissue is not affected by it. The rationale of the treatment is that the process of radiation is carried only to the stimulation point of the granulation tissue, which then tends to undergo fibrotic changes. Contraindications to X-ray therapy are exudative caseous forms and acute progressive cases. Combined X-ray and quartz light therapy is very warmly advocated, especially in productive forms of pulmonary tuberculosis.—*Die Strahlentherapie der Tuberkulose, insbesondere der Lungentuberkulose, A. Bacmeister, Ztschr. f. Tuberk., 1922, xxxvi, 502.*

X-Ray Treatment of Tuberculosis.—It is impossible to destroy the tubercle bacilli by means of the X-rays or to even affect them directly without injuring the body itself. We must therefore endeavor to strengthen the protective powers of the body. This can be done with a biological stimulant and in this way the X-rays can be utilized. Small doses act as stimulants upon the cells and their functions, while large doses can paralyze the cells and still larger ones destroy them. It is noteworthy that the sensitivity of individual cells to X-rays differs: the same dose may act as a stimulant to certain cell types and at the same time paralyze or destroy others. Bacmeister and Küpferle studied the effect of X-rays upon tuberculous tissues in animals with infected lungs, and found that with suitable technique and dosage the tissue reaction can be favorable to the animal. In pulmonary tuberculosis in man Bacmeister points out that the main emphasis should be laid on a stimulating action on connective tissue and not on a rapid destruction of the tuberculous cells. For this purpose the Turban classification is entirely unsuited and the Bacmeister scheme is preferable. This is a modified Albrecht-Fränkel and Aschoff classification. For X-ray treatment are mainly suited chronic, stationary and slowly progressing cases which tend toward latency and, secondly, those with nodose characteristics. All high fever, progressive pneumonic or caseous and exudative types are to be excluded. Small cavities in indurated forms are no contraindication, but they require caution. In pneumothorax or thoracoplastic cases conditions are more favorable than before such procedures are carried out. Emphasis is laid on the fact that all the other measures (hygienic, dietetic, pneumothorax, etc.), usually used in the treatment of pulmonary tuberculosis, are to be continued, and the X-ray to be considered merely as an adjuvant. In fever cases the rest cure should first be instituted to reduce the fever. X-ray treatment is given alternating with periods of rest. Good results were also obtained in hilum node tuberculosis and in the asthmatic conditions of older cirrhotic phthisis cases. In laryngeal tuberculosis the infiltrative forms yielded to treatment better than the ulcerative, and pain was usually relieved. In peritoneal tuberculosis good results were obtained, even though ascites was present. Sometimes, however, this required tapping if too great an accumulation of fluid was present. Bacmeister reported good results in intestinal tuberculosis and Krecke obtained exceptional cures in ileocecal cases. Genital tuberculosis of males and females was favorably influenced. Kidney and bladder cases did well. Noncaseated neck lymphomata of tuberculous origin gave excellent results, while even caseated cases yielded to the treatment if this was judiciously administered. The ulcerating types proved most trying, but good cosmetic results finally obtained. At first the secretion would increase, but it finally disappeared. It is concluded that roentgen raying can be utilized to advantage in every type of tuberculosis, and that with suitable technique and dosage it gives very satisfactory results, provided the body still possesses the necessary reacting power. It is emphasized that the roentgen treatment is only a reinforcement to the natural healing processes, in that it transforms the tuberculous granulation tissue into scar tissue. The general treatment should never be neglected. Massive roentgen ray doses are never to be used.—*Ergebnisse der Strahlentherapie der tuberkulösen Erkrankungen mit Ausnahme der chirurgischen Formen, A. Lorey, Centralbl. f. d. ges. Tuberk.-Forsch., July, 1921, xvi, 1.*

X-ray Treatment of Adenopathies.—In the inflammatory type of enlarged lymph node there is a rapid response to X-ray treatment; a few exposures are usually sufficient to cause practically entire

eradication of the disease. When there is no softening, the results are better than those obtained by surgery. In the presence of abscess formation or the finding of a softening or fluctuating focus, it is better to incise, evacuate and resume X-ray treatment. The sinuses heal in a few days and the resulting scar is very small. The changes wrought by the rays are a cellular inhibition and disappearance and a secondary fibrosis of the lymphatic channels, thus sealing off avenues for the spread of further infection. The differential diagnosis between simple inflammation and tuberculosis is very difficult. The latter exhibits a slower response to the rays. Recurrences are not infrequent but they usually react to repeated doses. Hygienic and dietetic discipline are vitally important and for this the roentgenologists and physicians should be in strict accord. Baetjer's belief, which is not strictly accepted, is interesting. It is that the so called thymus enlargements in young children and infants are merely enlarged or diseased substernal or mediastinal lymph nodes, and that their rapid disappearance and the good clinical effects produced after X-ray treatment are influenced by the same causes that produce disappearance of lymphatic swellings by this method elsewhere in the body. The response of the hyperplastic nodes of Hodgkin's disease and lymphosarcomata to radiation is extremely rapid. The growths seem almost to melt under the rays and in this sense they have a specific effect. In spite of this the patient goes steadily downhill as the disease is progressive. Carcinomatous glands respond slowly to X-rays and they rarely entirely disappear. The disappearance in one region may be accompanied by a rapid and progressive enlargement elsewhere. Occasionally the disease is arrested for a time. The newer technique of enormous doses, while still in the experimental stage, is sufficiently encouraging to justify a hope that we are approaching a new era, where the word carcinoma will not be synonymous with death. The action of X-rays on diseased tonsils and adenoids is to cause a marked diminution in size with the emptying of crypts, and within six weeks the tonsils shrivel to a small fibrous cord. This atrophy is permanent.—*The Roentgen Ray Treatment of the Adenopathies, M. K. Fisher, N. Y. Med. J. & Med. Rec., October 4, 1922, cxvi, 389.*

Prevention of Rickets by Mercury Quartz Lamp.—Ten rats were exposed for sixty-four days to these radiations. They were then killed and found to be free from rickets. The rayed animals also showed general improvement, so that the good effects were not limited to the skeleton. Codliver oil and direct sunlight produced similar results on the growth and calcification of the bones of the rat and on the general condition of the animal.—*Prevention of Rickets in Rats by Means of Radiation with Mercury Vapor Quartz Lamp, G. F. Powers, E. A. Park, P. G. Shipley and E. V. McCollum, Bull. Johns Hopkins Hosp., April, 1922, xxxiii, 125.*

New Treatment for Tuberculosis.—The waxy capsule of the tubercle bacillus is one of its greatest protections against chemotherapeutic agents. The caseous tissue, which contains the bacilli and is devoid of blood vessels, is another protecting factor for the bacillus. The rational therapy of tuberculosis would be to build up a defensive mechanism against the tubercle bacillus in the body itself. For this purpose the author stimulates, according to Abderhalden's conception of "defensive ferments," a protective mechanism. For this he prepares an ether extract of tubercle bacilli, injects it into normal animals and, when a necrotic papule with inflammatory reaction at the site of the injection occurs, blood is withdrawn from the animal and diluted. The preparation thus obtained is called the "ether-extract antibodies." This preparation is used as an inunction in cases of pulmonary and lymphatic tuberculosis with extraordinarily good results. The same method can be used in differentiating between tuberculous and nontuberculosis lymph node enlargement. The author prepared an ether extract of a microörganism found in the enlarged lymph nodes of a child, went through the same process as with the tubercle bacilli and treated the child with inunctions of the preparation obtained. The nodes disappeared, which was a proof of the nontuberculous character of the adenopathy. In incipient pulmonary cases the author invariably cured the condition by his method. Cases of laryngeal and far advanced pulmonary tuberculosis were very favorably affected by the treatment.—*Weitere Versuche zur Behandlung der Tuberkulose, F. Jessen, Zeitschr. f. Tuberk., October, 1922, xxxvii, 33.*

Turtle Bacillus Vaccine in Surgical Tuberculosis.—After extensive experimental work, clinically and bacteriologically, the author deems it fallacious to employ living, though avirulent, microörganisms, related to human tubercle bacilli, for the purpose of prophylactic and therapeutic

vaccination in surgical tuberculosis.—*Experimentelle und klinishe Untersuchungen mit Chelonin bei chirurgischer Tuberkulose, H. F. O. Haberland, Beitr. zur klin. Chirurg., 1922, cxxv, 117.*

Friedmann Treatment of Long Duration.—Twenty-two patients were treated with Friedmann's vaccine in 1914 and according to his indications. Before the preliminary report in May, 1914, seven of the 22 had died. Six others died during 1914, and one each in 1915, 1917 and 1921, all of tuberculosis. Of the remaining 6 cases one has disappeared and 5 gave no conclusive data. The results of Friedmann treatment in 63 other cases is given. Of these, 34 were definitely tuberculous, the remaining 29 being suspects. Of 32 cases with proved tuberculosis there was improvement in 6, no appreciable change in 9, aggravation in 10 and 7 cases died. Of 27 suspected cases, 1 improved, 2 were aggravated, 1 died and 22 revealed no appreciable change. The author does not feel encouraged to use the Friedmann remedy further. The same results could certainly be obtained without its use.—*Kontrolluntersuchungen länger zurückliegender Friedmann-Impfungen, C. Klieneberger, Centralbl. f. inn. Med., 1921, xlii, 769.*

Treatment of Tuberculosis with Vital Tuberculin.—After reviewing the different methods of specific treatment of tuberculosis the author concludes that up to the time of Selter's studies only one method had not been tried out and that was the use of living human tubercle bacilli in the therapy of tuberculosis. Selter with his "vital tuberculin" filled this gap. He observed that old cultures of tubercle bacilli break up upon tritration, so that only bacillary protoplasm and few intact living bacilli remain. He named the product *vital tuberculin*. Selter first inoculated himself with 2 mgm. avirulent human tubercle bacilli, which caused a rise in temperature for many days and intense focal reactions. The vital tuberculin injections do not cause intense reactions in small doses, but, as the doses are increased, the reaction becomes very severe. The author began the use of vital tuberculin in 1920. The commercial preparation, on microscopic examination, showed some acid-fast bacilli and an amorphous non-acid-fast mass. Cultures of this material on agar were negative. Inoculation of guinea pigs also gave negative results. The preparation, therefore, did not contain any living tubercle bacilli as claimed by Selter. Thirty-four patients with positive pulmonary tuberculosis in different stages of the disease were given injections of vital tuberculin. The initial dose was 0.0002 mgm., the final dose, 1 mgm. The interval between injections was eight to ten days. With smaller doses no local effects at the point of injection were noted. With increased doses abscess formation was of frequent occurrence. Examination of the purulent material from the abscesses revealed no acid-fast bacilli. The results of the vital tuberculin, from the clinical point of view, were no different than those obtained with other tuberculin preparations. In chronic and stationary cases slight improvement was noticed; in progressive cases no improvement whatsoever.—*Zur Behandlung der Lungentuberkulose mit "Vital Tuberkulin Selter," F. Klopstock, Klin. Wchnschr., 1922, i, 2088.*

Passive Immunization in Tuberculosis with Donkey's Blood.—An ideal treatment should be applicable to all cases and should demand no special knowledge in administration. The whole blood of a pregnant donkey mare immunized against living tubercle bacilli and pyogenic bacteria obtained from sputum was used. The donkey was selected because the ass family is naturally resistant to tuberculosis and it was believed that pregnancy increased this power. As it is not known whether the protective elements in an immunized animal are confined to the serum, the whole blood, citrated, was used. Inoculations were given three patients. The first, a far advanced case, bore the one injection of 15 cc. well but refused further treatment. The second, an ambulatory case, received two inoculations, one week apart; very definite reaction occurred, to be immediately followed by greater improvement in general condition. The third case was only apparently tuberculous, no sputum examination having been made. Two injections were given as in case 2 with similar results.—*Blood Immunization Method for Tuberculosis, A. S. Boyd, Lancet, November 4, 1922, cciii, 960.*

Resumé of Chemotherapy of Tuberculosis.—Not suitable for Abstracting.—*Ergebnisse oder Übersichtsberichte 3. Die Chemotherapie der Tuberkulose, Michels, Centralbl. f. d. ges. Tuberk.-Forsch., June, 1921, xv, 305.*

New Treatment for Tuberculous Pleurisy.—Injections of *Pectol* were given in 10 cases of pleurisy in tuberculosis and were found to cause a subsidence of the fever and an amelioration of constitutional symptoms. It was not, however, tried in third

stage cases.—*On New Treatment of Pleurisy and Pulmonary Tuberculosis with Especial Reference to the Use of Pectol, Kiyoshi Kinebuchi, Tokyo Iji Shinshi, March, 1922, Abstracted from Japan Medical World, June, 1922, ii, 170.*

Treatment of Tuberculosis with Guaiacol Iodoform.—The wonderful therapeutic results obtained by Mosetig-Moorhof with iodoform in the treatment of surgical tuberculosis prompted the author to elaborate a method of iodoform therapy for pulmonary tuberculosis. After repeated experimentation guaiacol iodoform was found to be the drug of choice on account of its tuberculocidal properties and the ease of its administration. Iodoform has the property of becoming very active in the presence of decomposing organic matter. Microörganisms, like anthrax bacilli that possess no reducing power, are not affected by iodoform, while reducing bacteria, like cholera and tubercle bacilli, are greatly affected by it. Gosselin showed that injection of 10 per cent of iodoform-ether caused a marked retardation of the tuberculous process in experimentally infected animals. Tubercle bacilli cultures that have been treated with iodoform produce a slow and chronic tuberculous infection in rabbits, while exposure to the drug for three weeks kills the bacilli altogether. Added to glycerine-bouillon, 5 per cent iodoform inhibits the development of the culture, while exposure to the same culture medium for forty-eight hours will destroy the bacilli. Iodoform acts best therapeutically when necrosis is present, that is, where the reducing property of the medium is at its highest. Not only will the drug kill tubercle bacilli, but it will act as energetically on the reducing microörganisms of secondary infections, so constantly present in pulmonary tuberculosis. At times the other bacteria will disappear from sputum even before the tubercle bacilli. When subcutaneous injections of guaiacol iodoform are given to tuberculous guinea pigs, the tuberculous process becomes either more chronic or arrested or entirely disappears. Caseation of inguinal and retroperitoneal lymph nodes was absent and there was no involvement of the spleen, liver and lungs. When the injections were stopped the tuberculous involvement of the above organs took their usual course. A series of 572 patients was treated by guaiacol iodoform. At first rectal suppositories of the guaiacol iodoform, containing from 0.5 to 2 gm. of the drug were used. The results were beneficial, but the drug proved too irritating for the rectum, and intravenous administration of the drug was performed. Three solutions were used: (1) a mixture of equal parts of olive oil and the guaiacol iodoform, (2) a solution containing 5 parts of the drug to one part of olive oil, and (3) the pure drug. The treatment began with intravenous injections of (1) twice weekly for four weeks in amounts from 0.5 cc. up to 1 cc. This was followed by solution (2) for four weeks in the same amounts, after which the pure drug was given for two to three months, once or twice weekly, in 1 cc. doses. After 10 to 15 injections fever disappears; then the tubercle bacilli in the sputum become less numerous and finally disappear, and with them the secondary pyogenic microörganisms. Sweats entirely disappear and diarrhea is gradually improved. Physical findings, such as disappearance of râles, showed unmistakably the arrest of the disease. Sputum became serous, and the subjective feeling of well being returned to the patients. The treatment in most cases consisted of only 40 injections, although in advanced cases 60 to 80 injections were necessary to arrest the disease. In the latter untoward symptoms after injection, such as chills and sudden drop of temperature below normal, were met with occasionally. As far as toxic action of the drug on other organs of the body is concerned, the author never noticed any, though animal experimentation to prove this fact is lacking. The question of permanence of cure is not answered, because not enough time has elapsed since the institution of the treatment. In incipient and moderately advanced cases, arrest of the symptoms for at least a year is easily effected. If there is an occasional rise of temperature, a suppository of the drug usually stops it. In far advanced cases the subsidence of symptoms lasts only several months, after which a new course of injections is necessary. The author warns against discontinuing the injections as soon as the patient becomes afebrile, but insists on carrying out the treatment according to his directions.—*Neues chemotherapeutisches Heilverfahren bei der Lungentuberkulose, W. Müller, Ztschr. für Tuberk., May, 1922, xxxvi, 26.*

Action of Quinine and Methylene Blue on Healing of Wounds.—Fluorescent substances were employed to determine their healing powers as a result of photodynamic action. Light in the presence of fluorescent bodies has a changed action, so that the visible light assumes chemical properties. The action of heliotherapy in tuberculosis has been explained by some as working in this way. Tests were made on guinea pigs, given a daily injection of 1 cc. of 1 to 1000 solution of quinine or of a 1 to 100,000 solu-

tion of methylene blue after the production of a superficial lesion. Many other photodynamic substances were tested, but these showed the best effect. Quinine was the most effectual in the strength designated. When comparing the animals kept in diffuse daylight and those in the dark, a marked difference was noted in the size of the area healed over after periods of eight to twelve days.—*Photodynamic Substances for Wounds, L. Torraca, Policlinico, February, 1922, xxix, 115.*

Bactericidal Action of Colloidal Silver.—Colloids of silver salts have a high germicidal value, especially colloidal silver chloride. This is nonirritating and does not stain unless it is exposed to light before it is washed. This preparation gives off emanations which prevent the growth of bacteria, but are not irritating to mucous membranes when used in a strength giving it a greater germicidal value than carbolic acid. Its selective action against bacteria is shown (Funke) by the fact that a 5 per cent solution of colloidal silver chloride, diluted 400 times, killed typhoid bacilli in two and a half minutes whereas spermatozoa could live 20 minutes in a 1 per cent solution. A 5 per cent solution diluted 4000 times and mixed with an equal quantity of secretion containing actively motile spirochetes stopped their movements in 4 minutes. These facts justified its use in 300 patients with genito-urinary troubles, and experiments are in progress to discover whether it will prove useful in tuberculous infections. Good results have been obtained in abscess cavities, fistulous tracts and in wet dressings for infected wounds, mastoid incisions, etc. Rabbits artificially infected with staphylococcus aureus and injected intravenously with 1 cc. of a 1 per cent preparation, had sterile blood within twenty-four hours, while controls died in from forty-eight to seventy-two hours.—*The Germicidal Character of the Emanations from Colloids of Certain Silver Salts (Preliminary Report), E. G. Ballenger and O. F. Elder, Surg., Gynec. & Obstet., July, 1922, xxxv, 57.*

Codliver Oil and Vitamin A.—A summary concerning the source of vitamin present in codliver oil is given. Experiments have shown that land animals cannot synthesize vitamin A and obtain their necessary supply from chlorophyll-containing plants either directly, by eating green vegetable matter, or indirectly, by eating the milk or flesh of other animals. In the sea the main source of vitamins for deep-sea animals are the unicellular algae and the vitamin is transferred through a series of animals of ascending sizes before it reaches large fish such as the cod. Thus, in the case of the cod, vitamin A is formed in diatoms and passes through two intermediate carriers, namely, the plankton and small fishes, before it reaches the cod. Codliver oil was originally produced by allowing the livers to putrefy and skimming off the oil. To do away with the objectionable taste and smell, Moller, in 1853, introduced the method of extraction by steam and practically all oil is now produced by this method. To determine the question whether the modern methods of manufacture tend to destroy the vitamins, investigations were made by Drummond and Zilva. They found that there was no evidence that the "steaming" method of production destroyed the vitamin A in the oil, and found that this method yielded oils of as high, if not actually higher potency than were yielded by the old and almost extinct "rotting" process. They also found that much variation may occur in the vitamin content of different samples of codliver oil although even the least active samples contain more vitamin than does butter. These variations are believed to be due to changes in diet or in the physiological state of the fish at different seasons. They also found that the livers of other fish yield an oil as rich in vitamin A as codliver oil. The investigation of vitamins is greatly hampered by the fact that the only tests available for demonstrating their presence or absence are biological tests which are difficult, expensive and extremely tedious. It is interesting to note that Drummond and Watson have discovered indications of the possibility of a chemical test for vitamin A in codliver oil.—*Codliver Oil and Vitamin A, Recent Investigations, Editorial, Brit. M. J., September 30, 1922, 610.*

Vaccination against Tuberculosis.—A vaccine was prepared from bovine and human tubercle bacilli, of virulence diminished by repeated transplantations after seven-week periods of incubation. The older cultures had the property of being easily triturated in an agate mortar. The vaccine then consisted of liberated protoplasm of the tubercle bacilli and of few nontriturated bacilli. Guinea pigs that were treated with the vaccine proved to be immune in numerous instances to a lethal reinfection, although the lesions from the primary infection were very slight and with no signs of an involvement of the internal organs. If the vaccine is prepared from too old a culture, the immunizing effect is absent. Therefore, one must select a vaccine that is sufficiently virulent to infect the animal, yet not able to produce a generalized infec-

tion. Bacillary protoplasm alone, in the absence of bacilli, and emulsions of bacilli without admixture of bacillary protoplasm will not make a potent vaccine.—*Über Tuberkulose-Schutzimpfung, H. Selter, Klin. Wchnschr., August, 1922, i, 1589.*

Clinical Thermometer in Prophylaxis of Tuberculosis.—In early life many people undergo wavelike attacks that are commonly labelled influenza and allowed to go at that. These are often early stages of tuberculosis, and a careful and systematic use of the rectal thermometer would soon establish the fact. It is the duty of all physicians to become acquainted with the normal daily temperature curve of the mouth, which is below 98°F. on awakening and 98.6° after a half hour's rest in the evening. Mouth thermometers should be left *in situ* for from fifteen to thirty minutes, to detect slight rises of temperature. The rectal temperature is by far the more reliable and a three minutes' insertion is sufficient to obtain an accurate record. Pulmonary tuberculosis is manifested in its earliest stages by a feeling merely of being below par, together with a slight degree of fever, which, under present conditions of thermometer usage, goes unrecognized.—*The Clinical Thermometer in the Prevention of Pulmonary Tuberculosis, E. Clark-Jones, Brit. M. J., November 25, 1922, no. 3230, 1026.*

Prophylactic Value of Discharged Patients to Communities.—Neglect of personal hygiene precautions and of health regulations on the part of tuberculous patients causes the spread of the disease. Certain patients may innocently and ignorantly spread the disease, others carelessly do so and still others are wilful in their violation of health codes. For all types, hospitalization is indicated: types one and two respond and become effective prophylactic agents: type three (the wilful) should be incarcerated in sanatoria until they learn to submit to sanitary regulations. In such institutions (as the Riverside Hospital, New York City) treatment for the disease is the same as that in any other sanatorium, but the patients are drilled as soldiers until they become automatons in their personal hygiene. Then they may be discharged with safety to the community.—*Discharged Patients from a Tuberculosis Institution a Prophylactic Asset in the Community, R. J. Wilson, N. Y. Tuberc. Ass. Bull., 1922, iii, no. 5, 8.*

Disinfection of Clothes Contaminated with Tuberculous Sputum.—Alkalilysol and Parol (called *alkalysol* or *parametol*) proved satisfactory for disinfecting clothes contaminated with sputum. A one-hour treatment with 5 per cent, and two to four hours with 3 per cent proved satisfactory. These substances are superior to cresol, cresol soaps, lysol, formaldehyde and sublimate.—*Über die Disinfektion mit tuberkulösen Auswurf infizierter Wäsche, P. Uhlenhuth and E. Hailer, Beitr. z. Klin. d. Tuberk., March, 1922, l, 208.*

Statistics on Relation between Infected Side and Prognosis in Pulmonary Tuberculosis.—Statistical study reveals that infection occurring on the right side in the lung is more common than on the left side, and infection occurring on the left side has a poorer prognosis than on the right side.—*A Statistical Contribution on the Relation between the Infected Side and the Prognosis in Pulmonary Tuberculosis, Keiji Aoyama, Osaka Igakkawai Zasshi, February, 1922, xxi, no. 2, Abstracted from Japan Medical World, August, 1922, ii, 241.*

Unusual Case of Spontaneous Pneumothorax.—A clergyman, aged thirty, was referred by a laryngologist whom he consulted because of dyspnea. Twelve years previously he had evidently had an attack of pleurisy on the left side, and in recent years there had been frequent attacks of pain in the left shoulder. There had also been a general breakdown four years previously, with night sweats and gastric disturbances and a diagnosis of chronic appendicitis had then been made. Immediately preceding the onset of his illness, he was unusually active, taking hard drives over country roads. The attack noted came on without warning, as the patient was dressing, and with a feeling as of sudden passing of gas from the stomach to the left back and chest, followed by unproductive coughing, a choking sensation and inability to bend the body forward. He held services an hour after the onset, but was unable to preach. Three hours later he suffered excruciating pain; this, however, subsided and an hour later he held a second service and preached as usual. He did not seek medical advice until the third day, when he was observed to be under some physical strain and slightly cyanosed and dyspneic, and presented typical physical signs of pneumothorax. He was sent to a hospital for rest and observation. The lung was quite evidently expanded by the tenth day and reëxpansion was practically complete in three weeks, a slight effusion occurring toward the base of the axilla as the pleural layers came in contact. In two months the patient returned to his duties. It was

presumed that the pneumothorax was due to the tearing of an old adhesion from the pleurisy of twelve years before.—*Spontaneous Pneumothorax: Report of Case with Recovery, P. J. McDonnell, J. Am. Med. Ass., December 30, 1922, lxxix, 2217.*

Treatment of Bronchiectasis.—Bronchiectasis unfortunately cannot be diagnosed early, that is, before considerable anatomic damage has been produced. But the symptom-complex is definite, and the disease is justly suspected where there is spasmodic cough (especially in the early morning and upon lying down) with large amounts of thick, foul, purulent sputum, sometimes associated with hemorrhage, clubbed fingers and toes, etc. The symptoms and signs are much like those of tuberculosis, but the consistent absence of tubercle bacilli in the sputum and study by X-ray usually reveal the true nature of the disease. Treatment is usually only palliative. The following procedures are employed: 1. Postural drainage. This relieves the patient for several hours at a time. 2. Bronchoscopy and drainage through the bronchoscope. This is sometimes helpful though difficult to accomplish. It locates the bronchus leading to the lesion. 3. Pneumothorax. After pneumothorax there is often great relief. 4. Thoracotomy. This is resorted to for breaking up adhesions and effecting lung compression by sutures in cases that are to be treated by pneumothorax. 5. Lobectomy. This is employed only after all other measures have failed: it is dangerous. Of three cases of lobectomy, one is in perfect health, one died six days after operation, a third has had the first stage of the operation successfully done.—*The Newer Treatments of Bronchiectasis, J. J. Singer and E. A. Graham, J. Missouri Med. Ass., 1922, xix, 390.*

Bronchiectatic Lung Abscess Cured by Incision and Drainage.—Typical bronchiectasis is, on the whole, a rather rare condition. The acquired form is usually seen in the young or middle-aged. The bronchiectatic lung abscess is usually caused by the aspiration of blood or mucus and infectious material from the pharynx, most commonly following tonsillar or nasopharyngeal operations, or the aspiration of stomach contents during general anesthesia or lavage, whereas the ordinary form of lung abscess follows pneumonia or influenza. In the treatment of bronchiectasis and bronchiectatic lung abscess, purely medical therapy can be but palliative, the process practically always progressing toward deterioration of the affected lobe or lobes; therefore, the physician should always consider his patient with a view to possible surgical interference. The surgical attack on the disease may be along conservative lines, by various procedures, such as bronchoscopic aspiration and local applications or gentle antiseptic irrigation; or by pneumonotomy with drainage; or, still more radically, by resection of the affected lobe or lobes. This last operation, even in experienced hands, still carries a mortality of almost 50 per cent. A less radical procedure, which has in a number of instances produced good results, is extrapleural thoracoplasty. The case reported illustrates the really great improvement and exceptionally complete cure of the disease which may follow incision and prolonged drainage, carried out with the intention of producing a temporary or permanent lung fistula. The patient was an engraver, aged 40, who became ill, June, 1916, following a circumcision operation under ether anesthesia. There was initial fever, beginning soon after the operation, and lasting four weeks, with cough after the first week, accompanied by sharp pain in the right axilla. Later there were night sweats. Following a sojourn in the Adirondacks, the patient was apparently well for a year, until September, 1917, when fever was again noticed, and foul sputum. Intermittent febrile attacks continued, and the patient coughed and expectorated, almost constantly, a very offensive sweetish sputum, resembling pure pus, and varying in amount from 473 to 720 cc. in twenty-four hours. Repeated examinations showed no bacteria except pneumococci, and guinea pig inoculation showed no evidence of tuberculosis. Physical and roentgen ray examination indicated a process in the right lung which was interpreted as nontuberculous, with some diaphragmatic adhesions. Attempts at lung collapse were unsuccessful. Operation was performed early in January, 1918, under regional and local anesthesia, and an abscess was encountered 6.3 cm. below the pleural surface, within the right upper lobe, which was attached to the costal pleura. The second rib was resected for 10 cm., and aspiration performed with a long needle of large calibre. The lung was then incised with a cautery, following the needle as a guide. Drainage was established with a split rubber tube and iodoform and gauze tampons, and a lung lip fistula established. After several months the drain was removed. There was steady symptomatic and general improvement. Nineteen months after operation, the patient was at work and in perfect health, except for slight morning cough and expectoration; the fistulous opening persisted. Four years after operation all symptoms had disappeared and the

skin entrance to the fistula was collapsed.—*Bronchiectatic Lung Abscess; Operation; Recovery, H. M. Kinghorn and W. Meyer, J. Am. M. Ass., December 9, 1922, lxxix, 1989.*

Treatment of Spontaneous Pneumothorax.—In three cases of spontaneous pneumothorax in previously supposedly healthy persons, the pneumothorax occurred during violent physical exercise. One case developed an effusion on the fourth day, which became purulent in a short time and the patient died after six weeks as a result of cardiac failure. The other two made a complete recovery in four and six weeks, respectively. The therapy in the last two cases consisted in partial and repeated removal of the air. This procedure is advised in all cases of closed spontaneous pneumothorax. If the pneumothorax is an open one injection of oxygen into the affected pleural cavity is advised. One case of an open spontaneous pneumothorax in an advanced case completely recovered by the application of this method. After the lung is collapsed and the fistula is definitely closed, aspiration of a few hundred cubic centimetres at one time should be preformed and oxygen in the same amount injected. As the oxygen is easily absorbed by the pleura, the re-expansion of the lung is materially facilitated by this procedure.—*Über die Behandlung des natürlichen Pneumothorax, V. Teubern, Klin. Wchnschr., August, 1922, i, 1766.*

Radical Treatment of Chronic Pleural Empyema.—In contradistinction to the usual method of treating chronic empyema in which the operation is carried up from the fistula, the author begins in the opposite direction and starts at the pleural dome. The hole, held open by the shoulder girdle and upper ribs, prevents healing of the wound. Access from the front seems the easiest and has the advantage that the pectoralis can be utilized to fill the pleural hole.—*Zur Radikalbehandlung des chronischen Pleuraempyems, Kirschner, Arch. f. klin. Chir., 1921, cxvii, 205.*

Tuberculin in Bronchial Asthma.—Liebermeister states that no prolonged cessation of attacks was obtained in the several cases of asthma treated with tuberculin, but in the course of the treatment of tuberculosis by tuberculin attacks of asthma are not infrequently seen. Kämerer believes that cases of latent tuberculosis show a certain predisposition to asthmatic attacks and that the clinical course of tuberculosis runs an inclination to fibrosis when asthma is present. The authors observed that asthma and hay fever cases give a very strongly positive Pirquet reaction, but they are not prepared to state whether the proteins of the tubercle bacilli play the part of a typical anaphylactic sensibilisin. Bonnamour treated 21 asthma cases with tuberculin with great improvement in 15 cases. Bouveyron warns against insufficiently long periods of tuberculin treatment in asthmatics. In many cases there is a definite connection between tuberculin hypersensitiveness and asthma. In all cases, in which the causative factor of asthma has not been determined or where other lines of treatment have failed, tuberculin treatment should be employed; moreover, therapy with a specific protein should be supported by tuberculin therapy.—*Über die tuberkulin Behandlung des Asthma bronchiale, W. S. van Leeuven and H. Varecamp, Klin. Wchenschr., September, 1922, i, 1834.*

Broncholithiasis.—Roentgenographs of the chest frequently reveal circumscribed nodular shadows, usually located at the hilum of the lung, which are considered to be calcified peribronchial lymph nodes. Calcified nodules in the lungs and adjacent structures are also encountered at necropsy. The presence of these calcified areas is a sign of chronic disease but, strictly speaking, no other diagnostic value can be assigned to them. The commonest form of lung concretion is the variety resulting from calcified tracheobronchial lymph nodes which, because of their proximity to the air passages, may perforate the bronchial wall by ulceration and, so gaining access to the lumen of a bronchus, be discharged by coughing. The clinical aspects of lung concretions possess no characteristic feature except the expulsion of the stone and the disturbances that accompany its discharge. To illustrate this, the case history of an instance of multiple grandular ulcerative broncholithiasis is presented. *History:* Male, 35, structural engineer, normal weight 178, became ill in August, 1920, with loss of weight and endurance incidental to severe professional demands. Had had pneumonia at the age of eight, epidemic influenza in 1918 and bronchopneumonia in February, 1920. After several months a productive cough without fever developed. A month later patient coughed up a small concretion about the size of a grain of wheat, the sputum being purulent and blood-tinged. Following this, many similar concretions were brought up. Gradually the cough became less persistent and stone expulsion less frequent although of larger size. Up to the present date (May, 1922) the concretions number sixty in all with a combined weight of 2.4 gms. Sputum

examination revealed no tubercle bacilli. Pneumococci, staphylococci and Micrococcus catarrhalis were present as are also many pus cells. Blood-calcium is slightly below normal. Auscultation revealed many coarse mucus râles most numerous and intense over the lower right chest behind. The X-ray showed only a moderate thickening of the structures radiating downward from the roots, with a few insignificant nodules of calcification in relation to the right hilum. This case appears to constitute an instance of multiple calculi of glandular origin which penetrate the bronchi by ulceration and are expelled singly with characteristic phenomena of stone asthma or bronchial colic. Chills, fever, hemoptysis and chest pain accompany each expulsion. There appears to be no bone disease present; tuberculosis is excluded and blood-calcium concentration does not exist. The primary etiological factor remains in doubt. There appears to be a morbid constitutional tendency to the laying down of calcium salts at the point least capable of holding them in solution.—*Broncholithiasis: Report of Case, A. R. Elliott, J. Am. M. Ass., October 4, 1922, lxxix, 1311.*

Bilateral Pulmonary Apoplexy.—A man died almost immediately after admission to the hospital for a generalized purpura. About two-thirds of the lungs were infiltrated with blood; they were deep red with irregular festooned outlines of the hemorrhagic zones. In the infiltrated portions were numerous tuberculous granulations. The anterior borders and the apices, in which the alveoli were extremely distended, were a pale rose color contrasting sharply with the hemorrhagic zones. The infarction was bilateral. —*Apoplexie pulmonaire diffuse des deux poumons, Courcoux, Meeting Soc. Méd. d. Hôp., Reported in Prog. Méd., June 31, 1922, 514.*

Hydatid Cysts of Lung.—Two cases of primary hydatid cyst of the lung are reported, one unilateral and the other bilateral. A previous report of 29 cases included no hydatid cysts primarily of the lung. It was formerly thought that the liver is the chief seat of the disease, but of late years more cases of echinococcus cyst of the lung have come to light, due to the more extensive use of the X-ray. The cysts tend to occur low down and near the periphery of the lung. They occur in two forms, closed and open. In the latter, membrane, vesicles and scolices have been found in the expectorated material. Spontaneous cure is very rare. The symptoms may simulate any pulmonary infection. Not until the cyst ruptures or the lung becomes inflamed will the patient be conscious of any trouble. Cough, pain and the expectoration of bloody or clear sputum are common. Fever is unusual unless the ruptured cyst has become secondarily infected. The complement fixation reaction may or may not be present, for it is absent if the cyst is dead. The X-ray is our chief aid in the diagnosis, especially in closed cysts. The latter show as dense, circular or oblong, sharply defined areas of evenly increased density within the lung field, the surrounding lung tissue appearing normal. Open cysts, which have ruptured into a bronchus, show an area of diminished instead of increased density, suggesting a large cavity with sharply defined borders. When rupture has occurred into the lung structures, the appearance closely resembles that of a lung abscess. The pleura may now be involved. Both cases reported complained of cough, pain in the chest and blood in the sputum. *Case 1*, age 22, a Greek farm hand, had been in the United States for five years. Symptoms had begun one and one-half years prior to admission with bloody sputum after slight exertion. The patient felt well until several days previously, when he had a real chill and felt feverish. The right lung showed dulness at the base: the sputum and the echinococcus fixation were negative. The X-ray showed a definite mass at the right base, the size of a grape fruit. Operation disclosed a large cyst filled with clear fluid, in which no hooklets were found. A fragment of the cyst wall showed only evidences of chronic inflammation. Twenty-one months later there was a return of symptoms and a further operation resulted in an uneventful convalescence. Pathological examination now confirmed the diagnosis. *Case 2* was also a Greek, shepherd, aged 25, and in the United States five years. Symptoms began about two years prior to admission, following an injury of the right side. For the last seven months the man had not been able to work. The lungs showed râles at both bases, with almost flatness at the right base: the sputum was negative but the echinococcus-fixation test strongly positive. The X-ray showed round and even densities with sharply defined borders in both lungs. There was also some lung involvement on the right and a shadow in the left kidney suggesting an echinococcus cyst. The patient was given a protracted course of X-ray treatment with no improvement. Echinococcus cyst of the lung must be thought of in cases of pulmonary disease with bloody sputum or hemoptysis, especially among the immigrant classes from continental Europe and Asia Minor. The disease is common in South

America, Australia and New Zealand. Wherever possible surgery is the treatment. —*Hydatid Cyst of the Lung. Report of Two Cases, G. M. Balboni, Boston M. & S. J., December 14, 1922, clxxxvii, 879.*

Syphilis of Lung.—As certain patients admitted to the Glenlomond Sanatorium showed physical signs suggesting tuberculosis, but with negative sputum, it seemed advisable to determine if any of these cases might be syphilitic in origin. It must also be borne in mind that "the spirochete is not above keeping company with the tubercle bacillus" and that syphilis and tuberculosis may occur together. Although syphilis of the lung manifests itself by fever, cough, expectoration and even hemoptysis, the course of the disease is slow and there is little disability. The physical signs usually indicate fibrosis of the middle and lower lobes. To determine the incidence of syphilis among the sanatorium patients, the Wassermann reaction was done on all admissions. The first 100 gave 6 per cent syphilis of the lungs, 11 per cent positive Wassermann and positive sputum (tuberculosis), 3 per cent positive Wassermann and negative sputum, although believed to be tuberculous, and 2 per cent positive Wassermann with diagnoses other than tuberculosis. Of the lung syphilis cases, four were of the fibrotic type and two showed areas of consolidation and catarrh. Hence the former is more common, and no patient of this type was under thirty-five years of age. The shortest time between infection by the spirochete and symptoms referable to the chest was three and one-half years. The two cases of focal disease occurred in younger patients. Antisyphilitic treatment insures speedy relief in the early cases but not necessarily a complete return to normal. Where bronchiectasis is well established treatment is not likely to lead to improvement.—*Syphilis of the Lung, W. T. Munro, Lancet, December 30, 1922, cciii, 1376.*

Tertiary Rhinopharyngeal Syphilis Mistaken for Lupus.—Siemo reported the case of a man without syphilitic antecedents but suspected of tuberculosis. Treatment with arsenobenzol resulted in cicatrization.—*Siemo, XXXIV Congress de la Soc. Francaise D'Oto-Rhino-Laryngologie, Paris, July 17–18, 1922, Reported in Presse Méd., August 2, 1922, xxx, 660.*

Cause of Scoliosis.—Respiratory insufficiency which plays an important part in the genesis of infantile kyphosis was thought by Lance to be only an accessory factor in scoliosis. The chief cause of so called essential scoliosis lies in the primitive assymetries of the bony vertebrae, a very frequent condition as the X-ray shows. Pescher believes that respiratory insufficiency is constant in cases of deformed thorax; hence improvement by means of respiratory gymnastics is indicated in these cases. The means by which amelioration is accomplished are both mechanical and trophic.—*A propos de scoliose, Meeting Soc. de Méd. de Paris, June 24, 1922, Reported in Prog. Méd., July 15, 1922, no. 28, 336.*

Tabetic Kidney Diagnosed as Tuberculosis.—A case of kidney disease in an Italian man twenty-eight years old is described. The symptoms were pain in the right groin of twenty-two days' duration, not radiating (daily vomiting for the previous two weeks), marked dysuria of two years' standing and a recent attack of gonorrhea. There was no history of hematuria and family and past history were unimportant. On account of the pale urine loaded with pus, the marked frequency, the lack of kidney function and the presence of a diffuse cystitis on cystoscopic examination, a diagnosis of bilateral renal tuberculosis was made, despite the fact that tubercle bacilli were not found in the urine. Later, the patient developed intense pain with a marked girdle sensation. A definite history of syphilis of over two years' standing was then obtained. Spinal puncture revealed an increase in globulin content, but with no cell increase and a negative Wassermann. Death occurred in a few days and an autopsy bore out diagnosis of syphilis and disproved the presence of tuberculosis.—*Tabetic Kidney Diagnosed as Tuberculosis, H. S. Jeck, N. York M. J. & Med. Rec., November, 1922, cxvi, 529.*

Sporotrichosis.—Sporotrichosis is more frequently encountered than any of the other dermatomycoses. While the disease is usually confined to the cutaneous and subcutaneous tissues, it may also involve many other parts of the body. It usually starts with a trivial trauma. Later the part becomes swollen, livid or bluish and discharges a syrup-like secretion which may be tinged with pus or blood; the hands are usually involved first because they are most often exposed to injury. The secondary lesion is in the form of a firm and moderately tender nodule, usually in the direction of the trunk and located deep in the subcutaneous tissues. Later, more nodules in various stages of development extend up the arm in chain-like fashion; usually there are four to six such lesions extending from the injury on the hand to the elbow. The patient appears and feels well and has little

or no elevation of temperature. The disease may affect parent and child. It may have the appearance of latent syphilis; or, at the site of the initial lesion or chancre, it may present the clinical appearance of a tuberculosis verrucosa cutis or of blastomycosis or of both. The disease may attack the tendon sheaths, periosteum or bone; it may also infect the blood stream and produce a septicemia and a generalized gummatous process of the skin, together with gummatous lesions of the liver and other viscera, and *Sporotrichum* may be recovered from the blood stream. It may be associated with tuberculosis,and may attack structures such as the pharynx, larynx, trachea and mucous membrane of the mouth, along with tuberculosis; in such cases the body defense is not usually able to put up a strong fight against the invader. The disease has been produced in experimental animals. Except where there is a secondary infection the microörganism usually grows readily on the simpler media, and it is sometimes found microscopically in the pus. Tissue sections show a lymph connective tissue, or the so called syphiloid zone, and an epithelioid or tuberculoid one, with a suppurative area. The agglutination test of Widal and Abrami is not specific as against some of the other mycoses, except as to the dilutions and time; while the spores agglutinate the mycelia do not. The prognosis in the uncomplicated cases is good. The treatment by iodides internally, and the application locally of dilute iodine-potassium iodide solution are specific. There seems to be no potential danger of disseminating the microörganisms or absorbing the granulomatous tissues.—*Sporotrichosis, F. W. Cregor, J. Am. M. Ass., September 2, 1922, lxxix, 812.*

Local Blastomycosis.—Reports in the literature of local blastomysosis other than of the skin could not be found. In the case observed, a blastomycosis of the neck and face had existed for twelve years; healing followed iodide therapy but occasionally new lesions appeared about the old scars. A mass then developed in the left scrotum which 'was thought to be tuberculous or malignant, but on removal it was found to be blastomycosis of the epididymis. The patient recovered. Metastasis to the epididymis is an apparently rare finding. Even microscopically the lesion may be mistaken for tuberculosis until the blastomycetes are found. The most probable entrance for the microörganism is through the skin, although some cases begin in the throat and lungs. *Conclusions*: 1. There are cases of blastomycosis other than dermal. 2. The microörganism may attack any organ or the bony framework. 3. It is probably spread through the blood stream.—*Local Blastomycosis, M. Haase, E. R. Hall and C. H. Marshall, J. Am. M. Ass., September 2, 1922, lxxix, 820.*

Hodgkin's Disease Following Dysentery.—In the case reported, Hodgkin's disease developed four months after the onset of dysentery. The clinical course was typical, with progressive enlargement of the nodes in the neck, mediastinum and axilla, fever, anemia and weakness. A tissue section had the appearance of Hodgkin's disease. Later amebae and two flagellates were recovered from the stools. Significant prompt improvement followed remedies directed toward amebiasis. X-ray treatment was also given.—*Hodgkin's Disease Following Dysentery, G. L. Lambright, J. Am. M. Ass., September 2, 1922, lxxix, 809.*

Postinfluenzal Chronic Pneumonitis.—A semichronic pneumonic sequel of influenza was recognized just after the epidemic of 1918. The disorder referred to here is found in patients presenting themselves now, four years and more after the epidemic, with a history dating from that time. *Symptomatology:* All patients complain that they have not been well since the attack; they are tired and weak, lack staying power and ambition to work, or have found themselves unable to do so. They have spent much time in hospitals and sanatoria since the epidemic. There is rarely marked loss of weight, although undernutrition is common. A marked degree of nervous excitability is very characteristic and may interfere with their ability to make a living. Cough is present, especially in the morning and in damp weather. Sputum is variable, occasionally showing a little blood, but frank hemorrhage is rare. Pain or soreness in the chest is common. All complain of dyspnea and palpitation or throbbing on slight exertion, and usually attacks of dizziness. *Physical Examination:* The patients rarely appear markedly ill. Examination of the lungs yields a variety of findings, usually diffuse in distribution. Expansion is usually good, unless there are pleural adhesions. Resonance is usually good, occasionally showing basal impairment, rarely apical, and may change from day to day. The breath sounds are usually harsh, rough and noisy; sometimes expiration is prolonged. Noisy squeaks and sibilant or sonorous râles are generally heard, but never the typical burst of medium moist râles after expiratory cough which occurs in tuberculosis. The roentgen picture usually shows some abnormality,

such as diffuse thickening, tortuous and interwoven bronchial markings, diffuse dilatation, small areas of increased density, mottling at the base or moderate hilum thickening. These findings may vary from time to time. There is usually a slight afternoon elevation of temperature. According to the predominant symptoms, there might be described an asthmatic, bronchitic, pleural or effort syndrome type, but they are rarely clear-cut. The course is chronic and remarkably even and free from the "ups and downs" of tuberculosis. *Differential Diagnosis:* Tuberculosis is to be differentiated from this condition by the absence of localization in the upper lobes, the less marked pathological changes, as revealed especially by the X-ray, and the repeated absence of tubercle bacilli in the sputum; also by the absence of typical toxemia, the history of severe influenza and pneumonia, and the different character of the physical findings, especially the râles. The pronounced evidences of nervous instability and the absence of typical signs and symptoms distinguish it from organic heart disease, although there may be a slight systolic murmur, perhaps an occasional extrasystole, or a slight puffing sound along the left sternal border. The condition should be distinguished from hyperthyroidism by the absence of exophthalmos, thyroid enlargement, or increased basal metabolism. *Incidence:* This is difficult to state, but certainly the condition is not uncommon.—*Postinfluenzal Chronic Pneumonitis, F. H. McCrudden, J. Am. M. Ass., March 3, 1923, lxxx, 609.*

Chemotherapy of Experimental Pleuritis.—Studies with ethyl-hydrocuprein hydrochlorid (*optochin*) in the treatment of experimental pneumococcus pleuritis and meningitis have indicated that, in chemotherapeutic investigations in bacterial infection, localized infections of serous cavities offer a more favorable means for eliciting therapeutic effects of a medicament than generalized infections and bacteremias. In these localized infections it is possible to inject into the sacs sufficient amounts of medicament to be bactericidal and curative. These amounts may be at least one-half the maximum tolerated doses. In rapidly fatal generalized infections with bacteremias, however, the intravenous injection of one-half the maximum tolerated dose may be without therapeutic effects. Localized bacterial infections of serous cavities would appear to be especially useful for chemotherapeutic studies with medicaments possessing high toxicity, when the margin between *dosis tolerata* and *dosis curativa* is small. For the production of these infections test animals possessing some natural immunity to the test bacterium should be used, like the guinea pig for pneumococcus pleuritis and pericarditis, the cat or dog for pneumococcus meningitis and the dog or rat for tuberculous pleuritis. The test microörganisms should be of moderate rather than extreme virulence, in order to reduce the invasiveness or aggressiveness of the bacteria for the blood and other organs. The author believes that localized tuberculous pleuritis and pneumonitis offer more favorable lesions for studies *in vivo* than generalized and widespread lesions, the medicaments being injected into one or both pleural cavities at varying intervals after the injection of the bacilli into one sac.—*Studies in the Chemotherapy of Bacterial Infections. II. The Chemotherapy of Experimental Localized Bacterial Infections with Special Reference to Pleuritis, J. A. Kolmer, Arch. Int. Med., January 15, 1923, xxxi, 9.*

Respiratory Gymnastics in Purulent Pleurisy.—At a meeting of the Société Francaise de Physiothérapie, the work of Georges Rosenthal, concerning the superiority of respiratory gymnastics to other postoperative manoeuvres, was discussed. He is convinced of the necessity of respiratory gymnastics after thoracotomy, which should include complete nasal, costal and diaphragmatic breathing. The treatment should be begun before and be resumed the fifth day after operation; there should be a daily or twice daily exercise of twenty to thirty minutes, during which the patient extends and abducts the arms while making a slow, deep inspiration. This method is superior to Pescher's bottle respiration which fails to remedy insufficient nasal breathing and the diaphragmatic paralysis which is often caused by purulent pleurisy. He quotes from Anselme Schwartz, surgeon at the Necker Hospital, who says that the *sine qua non* of a complete and lasting cure of purulent pleurisy is conservation of the elasticity of the lung, a condition not to be obtained except by respiratory gymnastics which will insure the propinquity of the lung to the wall by preventing the wall from falling in on the lung. The fact that respiratory repose does not exist during life should dissipate the fear of maintaining a series of gentle, rhythmic respiratory exercises.—*Autour de la gymnastique respiratoire, Meeting of Société Francaise de Physiothérapie, Paris, June 2, 1922, Reported in Prog. Méd., July 1, 1922, 311.*

Multiple Tuberculous Thoracic Fistulae.—An extrapleural infection in the tis-

sues near the pleura costalis resulted in multiple fistulae developing.—*Ein seltener Fall von multiplen Lungenthoraxfisteln, A. Gehrcke, Beitr. z. Klin. d. Tuberk., March, 1922, l, 384.*

Physiological Effects of Acute and Chronic Pneumothorax.—The interdependence of respiration and intrapulmonary circulation is a nice example of coördinated functions. The degree of integrity of the pulmonary circulation measures not only intrathoracic function but also pleural and pulmonary powers of defense and repair. Whenever intrapulmonary pressure exceeds intravascular tension a proportion of the blood destined normally to reach the compressed lung area is diverted to channels offering less resistance. If air passages are free and lung tissue elastic the result is increased inflation in the portion of the lung to which extra blood has been delivered, a compensatory physiological emphysema. On the contrary, a temporary stoppage of pulmonary circulation produces atelectasis, a permanent stoppage atrophy. The occurrence of compensatory physiological emphysema in human lungs has been long recognized clinically; its extent depends on the amount of lung compressed and the competence of the circulation. Zones of emphysema have been noted around areas of hemorrhagic infiltration and early foci of bronchopneumonia. Skodaic resonance, so often present above an effusion, has also been found in the presence of hemothorax, and is due to emphysema in the portion of the lung above the effusion. With unilateral pneumonia or effusion a contralateral emphysema is the rule. Operators have contributed two important observations: (1) that the extent of deflation tolerable without distress was greater the better the general physical condition, and (2) that, when complete deflation was possible, the mediastinum became convex toward the open side; in other words the undeflated lung tends to bulge outward. Cats and dogs, animals of the thin pleura type, have a non-airtight mediastinum, while in man and the monkey, with thick pleura, the mediastinum is airtight. Hence unilateral pneumothorax is possible in man and the monkey but impossible in the cat and dog. Experimental observations show that increasing pulmonary compression is met with rising blood pressure and that so long as this compensation is adequate respiratory distress does not occur. The effects of debility and fatigue can be demonstrated in monkeys. In such cases the reaction to unilateral pulmonary compression resembles that of the dog. In other words, with inadequate powers of cardiac compensation compensatory contralateral emphysema does not occur and the animal reacts as if the pneumothorax were bilateral. The effects of chronic pneumothorax have been studied in the monkey. There is a thickening of the visceral pleura, due to proliferation of the mesothelial cells of the serosa and the subserous elements. Air is irritating to serous membranes and long-continued compression by it makes for decreased pulmonary elasticity and curtails normal respiration. Further conclusions are based on personal clinical experience with over 200 soldiers suffering from intrathoracic injuries, including 125 open thoracotomies, in 93 of which differential pressure was used, as well as upon many animal experiments cited. All the patients who died came to necropsy. *Conclusions:* 1. Acute pneumothorax is dangerous in so far as it interferes with the pulmonary circulation, the extent of the danger being determined by the integrity of the circulation, chiefly by the latent energy of the myocardium. Therefore, 2. Open thoractomy should be performed with some form of differential pressure, that deflation may be gradual, transient, and not excessive. The operation is incomplete until full pulmonary inflation is again obtained and maintained, which is only possible when one-way drainage is used. Gas-oxygen positive pressure analgesia as developed by Gwathmey is the best method available. 3. Chronic pneumothorax, as well as chronic pulmonary compression by the inevitable pleuritic effusions, should be avoided.—*Effects of Acute and Chronic Pneumothorax (A Preliminary Report), J. L. Yates, Amer. J. M. Sci., January, 1923, clxv, 1.*

Double Spontaneous Pneumothorax.—A woman, twenty-two years of age, since she was two and one-half years old, had been practically invalided by frequent attacks of true paroxysmal asthma, a tendency which she apparently had inherited from both father and mother. This asthma led to marked chronic hypertrophic pulmonary emphysema; there was no evidence of a hereditary tendency to emphysema. One result of the latter condition was a chronic partial pneumothorax, so latent that it was not suspected until the roentgenograms of her chest were studied; the date of its onset could not be ascertained from the history, but it certainly was present for months before her death. Sudden death followed the sudden development of a double pneumothorax while she was straining at stool. While well over 90 per cent of all cases of pneumothorax are due to tuberculosis, that disease can be ruled out in this case since there was no evidence of it during

life or at autopsy. The double pneumothorax of the patient was due to chronic hypertrophic pulmonary emphysema; it is remarkable that this condition does not lead to pneumothorax more often. In chronic hypertrophic pulmonary emphysema, the disappearance of the septa between many adjacent alveoli results in the formation of large air spaces or blebs, each the sum of many alveoli. The superficial blebs have the pleura as external wall, the nutrition of which is certainly precarious, since the normal pleural membrane receives its nutrition from the underlying lung tissue. The result of the disappearance of groups of underlying septa with their blood vessels must be a progressive atrophy of the pleural membrane at these points from lack of nutrition, until the pleura becomes so weak that it may rupture with ordinary respiratory movement; this explains the nontuberculous pneumothorax occurring during sleep or more often as a result of some spasmodic effort. In the case of those previously healthy, however, the bleb must have been the result of interstitial emphysema rather than of the chronic hypertrophic variety. The lung itself must be frequently ruptured by coughing and other strains, but the pleura protects against pneumothorax, although it may be raised free from the underlying lung into blisters of air escaping into the interstitial lung tissue. So difficult is it to rupture the pleura that in cases with severe paroxysmal cough and in the strain of parturition, the air will dissect its way along the bronchi into the mediastinum and then through the suprasternal notch into the subcutaneous tissue over the chest wall, and yet none find its way into the pleural cavity. In cases of chronic hypertrophic emphysema such as this girl had the bullae present may be even as large as a pigeon's egg. While emphysema is the proved cause in relatively few cases of pneumothorax this is the only case on record of double pneumothorax due to emphysema.—*An Unusual Case of Double Spontaneous Pneumothorax, C. P. Emerson and R. C. Beeler, Amer. J. Roentgenol. & Rad. Therap., February, 1923, x, 126.*

Bronchiectasis with Unusual Complications.—The first case reported is one of bronchiectasis of fourteen years' duration. The patient at times expelled pus in great quantities and with such force that it was projected into the nasal cavity, resulting in infection of the accessory sinuses. The second case was one of ten years' duration. The patient had a chronic nephritis, presumably toxic in origin, and a chronic glossitis, the tongue being deeply fissured. The latter condition undoubtedly arose from direct contact with pus expelled from the lungs, and despite careful cleansing with antiseptics the tongue remained enlarged and chronically inflamed, with but slight inconvenience in the form of some local discomfort.—*Bronchiectasis with Unusual Complications, I. J. Davies, Brit. M. J., March 3, 1923, no. 3244, 374.*

Pulmonary Calculi.—There are two principal varieties of pulmonary calcification: one that has its origin in a chronic or healed inflammatory area, tuberculosis being usually the cause, and one that is part of the pathological changes in calcium and phosphorous metabolism, whereby these salts are laid down at places by high acid concentration. The latter is a metastatic calcification. The former is usually localized or irregularly distributed, whereas the latter is more uniform and may be universal in the pulmonary tissue, blood vessels and serous membranes. It is also possible for stones to form in bronchiectatic cavities, around a nucleus of organic matter, especially if drainage from dilatation is imperfect. A case is reported of a patient who recovered from tuberculosis and later developed bronchiectasis with excessive cough and expectoration, and dyspnea. For several years he was conscious of a sensation that indicated to him the presence of a foreign body in his lung. Following a reaction to vaccine treatment he coughed up two calcareous fragments, one of which measured 4 x 3 x 2 mm. The smaller piece on examination showed traces of calcium carbonate, calcium oxalate and magnesium phosphate; there was also a little organic matter.—*Pneumolith or Broncholith, H. Fox, J. Am. M. Ass., January 20, 1923, lxxx, 175.*

Pulmonary Streptotrichosis.—A case of streptotrichosis of the left lung with exudate is described. Healing occurred after operation. This mold attains the bronchioles by inhalation. Localization is conspicuously in the lower lobes. Through coughing the microörganism can get to healthy portions of the lung by way of the lymphatics. Abscess and gangrenous foci, bronchiectasis, and, finally, pleuritis and marked fibrosis result. Entrance into the circulation may occasion pyemia. The differential diagnosis from tuberculosis may be difficult. The prognosis is as a whole unfavorable. The therapy should consist of opening the gangrenous areas and giving potassium iodide.—*Über Lungenstreptotrichosen, F. Peemöller, Beitr. z. Klin. d. Tuberk., March, 1922, l, 523.*